182

DEVOTED TO RESEARCH AND CLINICAL STUDY OF THE DISEASES AND PROCESSES OF AGING

Geriatrics

VOLUME 9 · NUMBER 1 January 1954

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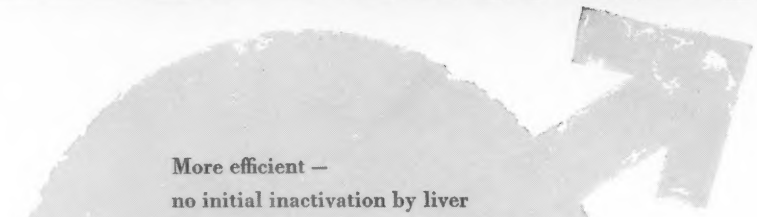

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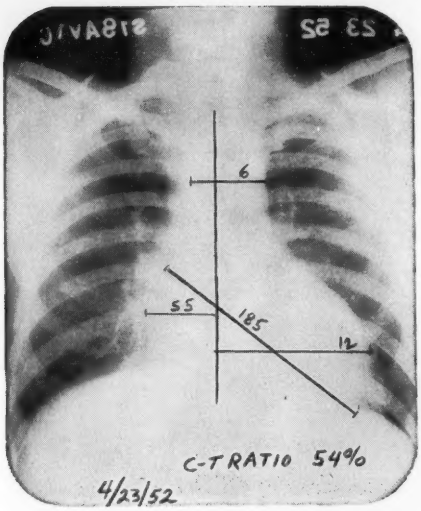
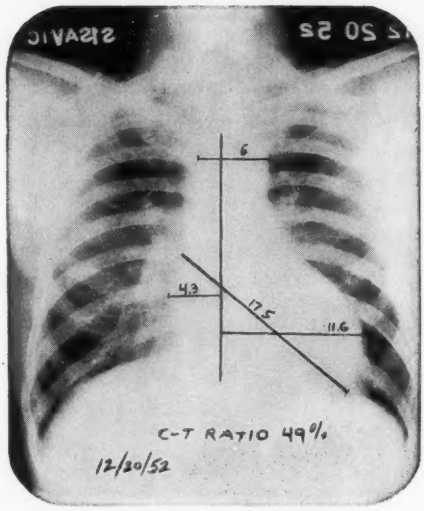


Patient F.S. before Methium: Cardio-thoracic ratio 54%, blood pressure 240/160 mm. Hg.[1]



After Methium: Cardio-thoracic ratio 49%, blood pressure 160/100 mm. Hg. This patient (F.S.) experienced no toxic side effects and did not lose a single day of work.[1]

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In the first few months of therapy, over 80 per cent of the patients treated with oral hexamethonium have had gradual reduction in mean blood pressure of 20 mm. Hg or more.[2,3] With continued treatment, up to or beyond a year, this reduction can often be maintained with no serious side effects and *no increase in dosage.*[3]

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1. Kuhn, P. H.: Angiology *4*:195 (June) 1953.
2. Moyer, J. H.; Snyder, H. B.; Johnson, I.; Mills, L. C., and Miller, S. I.: Am. J. M. Sc. *225*:379 (April) 1953.
3. Moyer, J. H.; Miller, S. I., and Ford, R. V.: J.A.M.A. *152*:1121 (July 18) 1953.

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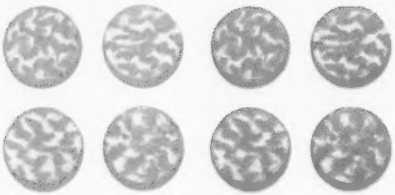

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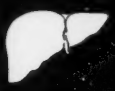
condition	 *incidence of liver dysfunction*	*incidence of blood lipid abnormalities*	*suggested therapy*
obesity	frequent + + +	frequent + +	Methischol plus balanced low calorie diet.
diabetes	frequent + + + +	frequent + + +	Methischol as adjunct to diet. Insulin as necessary.
atherosclerosis	frequent + + +	frequent + + + +	Methischol and high protein, low fat diet.
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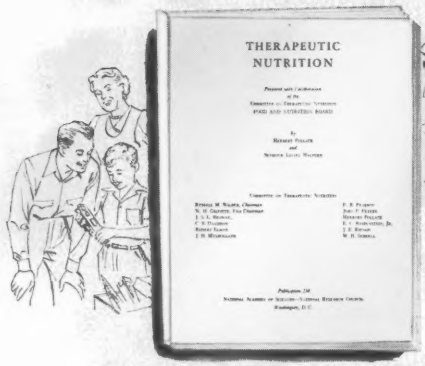

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Folic acid	1.5 mg.
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* Therapeutic Nutrition, Publication No. 234, National Research Council.

GERIATRICS

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Volume 9
Number 1

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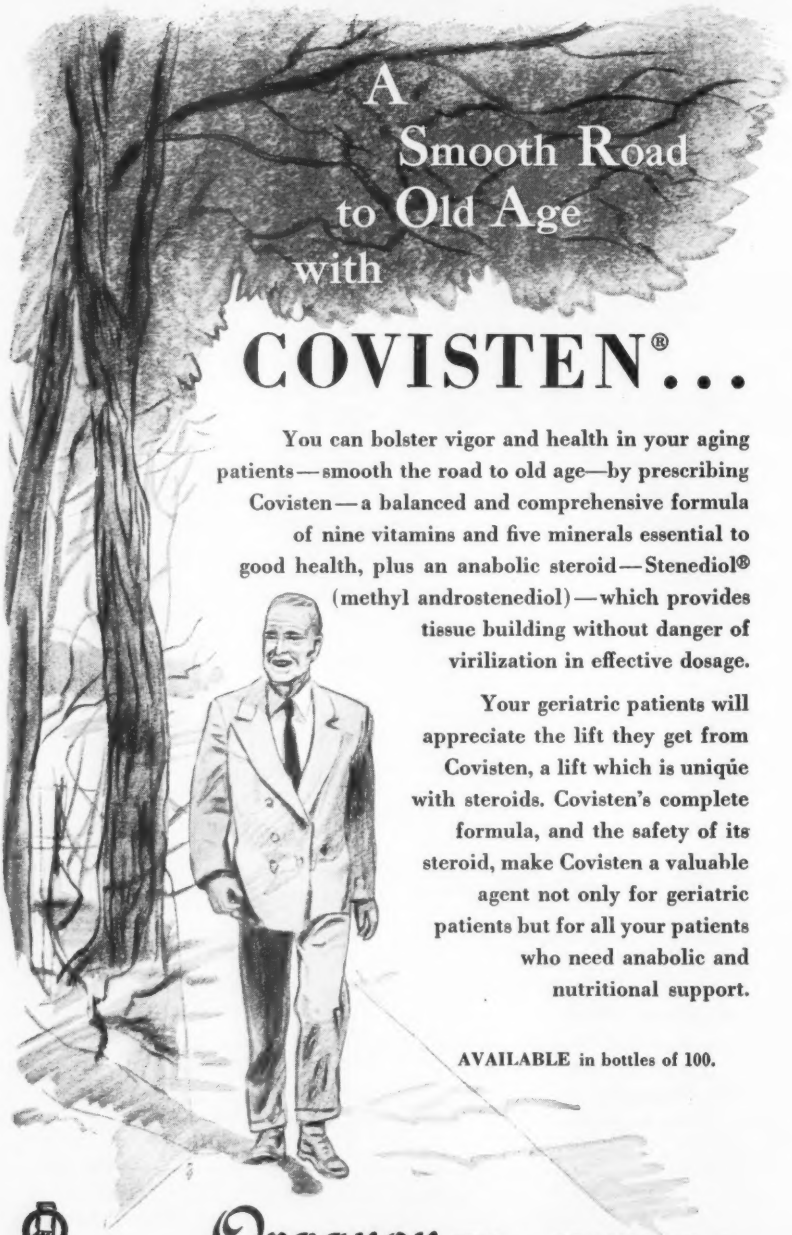

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Looking forward

Papers and authors you will meet in the February issue . . .

Although there are no characteristic **Cardiac Arrhythmias in the Aged,** certain abnormalities such as a negative T wave in lead I, a widened QRS complex, and auricular fibrillation, are encountered far more commonly in geriatric patients. David Scherf, of the Department of Medicine of the New York Medical College, describes patterns often seen in the aged and discusses the clinical evaluation of certain arrhythmias in so far that it differs from that in younger individuals.

•

With extra precautions in preoperative care and selection of the proper operative technique, **Gallbladder Surgery in the Aged** can be performed without hazard in the majority of cases. Max Thorek, Chicago, secretary-general of the International College of Surgeons, recommends electrocoagulation as the procedure of choice in obliteration of the gallbladder since it minimizes shock, makes drainage unnecessary, and permits complete closure of the abdominal wound. In a series of 5,000 unselected cases, the coagulation procedure carried a mortality of only one third of one per cent.

•

Willet F. Whitmore, Henry T. Randall, Olof H. Pearson, and Charles D. West of the Division of Sloan-Kettering Institute and the Memorial Center for Cancer and Allied Diseases in New York City, report on a series of 17 cases of prostatic cancer in which bilateral adrenalectomy was performed. Of the 15 who survived one week postoperatively, 11 obtained a subjective remission and only 2 showed objective improvement. The authors discuss the potential reasons for the failure of adrenalectomy as treatment for prostatic cancer and indicate directions of future therapy.

•

In order to learn more about **Symmetrical Enlargement of the Salivary Glands in the Aged,** George Kelemen, instructor in otology at Harvard Medical School and assistant surgeon at Massachusetts General Hospital, made a survey of 100 persons, 50 men and 50 women, ranging in age from 71 to 91, at Long Island Hospital of the City of Boston. In 22, symmetrical, nontender enlargement of the glands was found which could not be attributed to any pathology. The author believes such enlargement may be a characteristic change in physiologic involution and recommends further study of this condition.

•

For these and other articles, abstracts, reviews, and special features, read every issue of Geriatrics.

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1. Van Cauwenberge, H.: Lancet 261:374, 1951; Van Cauwenberge, H., and Heusghem, C.: Proc. Soc. Exper. Biol. & Med. 80:51, 1952. 2. Pelloja, M.: Lancet 1:233, 1952. 3. Paul, W. D., et al.: J. Am. Pharm. A., Scient. Ed. 39:21, 1950.

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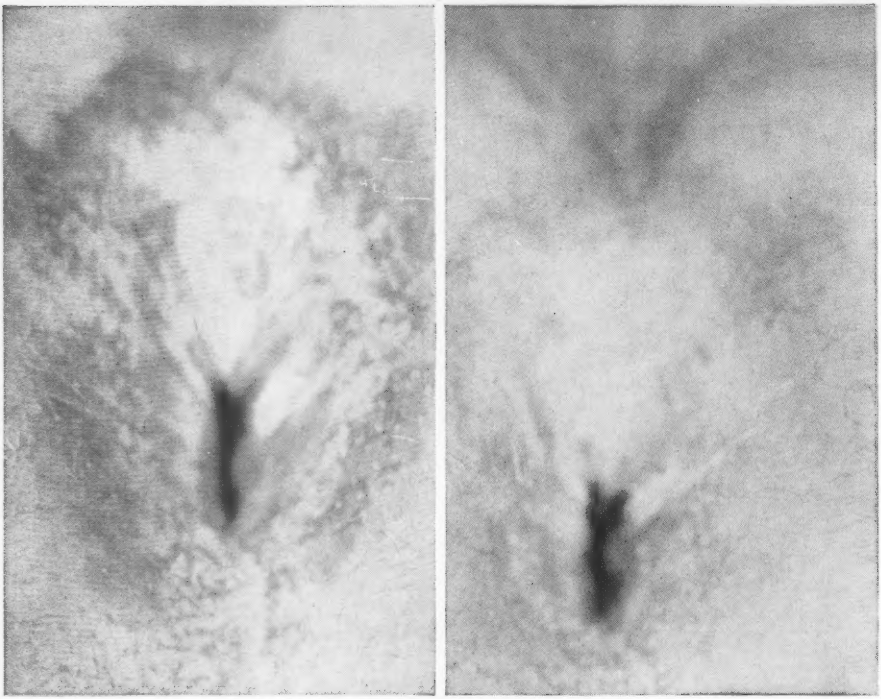

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*Alexander, R. M. and Manhein, S. D., *J. Invest. Dermat.* **21**: 223-225, October 1953.

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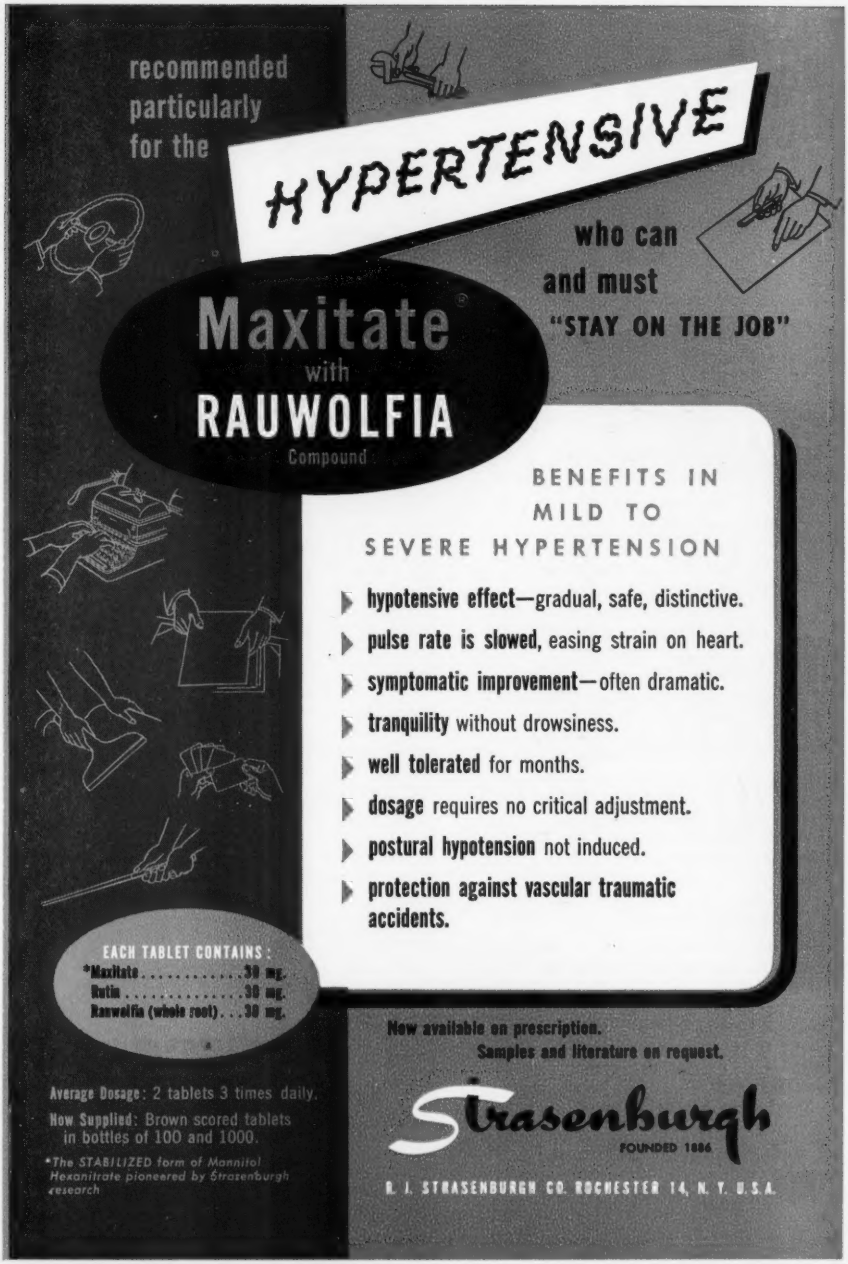
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There is...

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Dosage: One dose per day, initially 2 tablets (2 mg. each), taken on retiring, usually suffices; after full effect is reached, 1 tablet per day frequently is adequate for maintenance.

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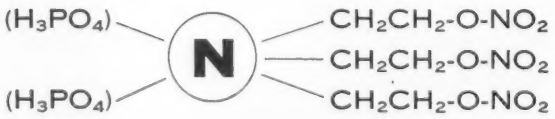

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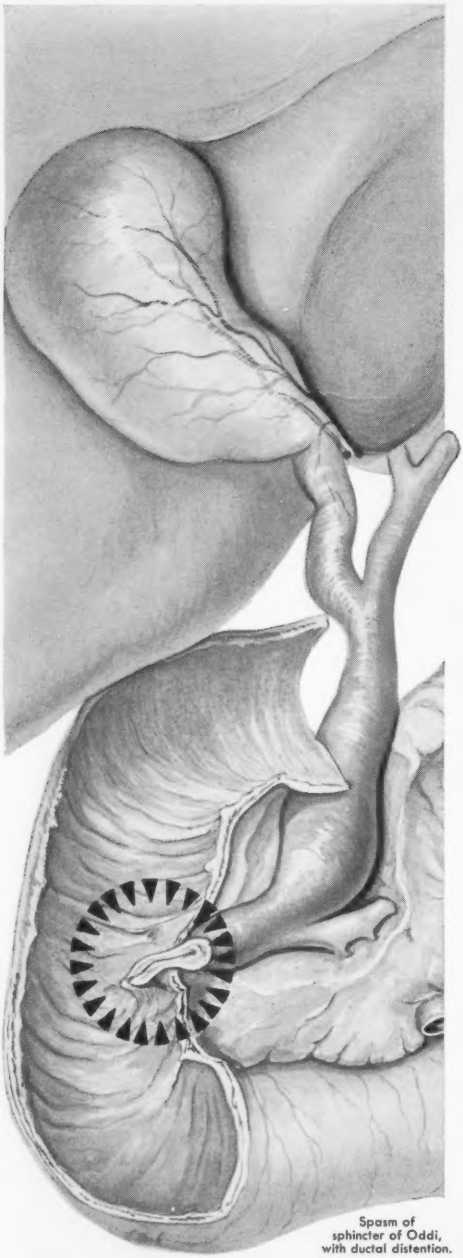

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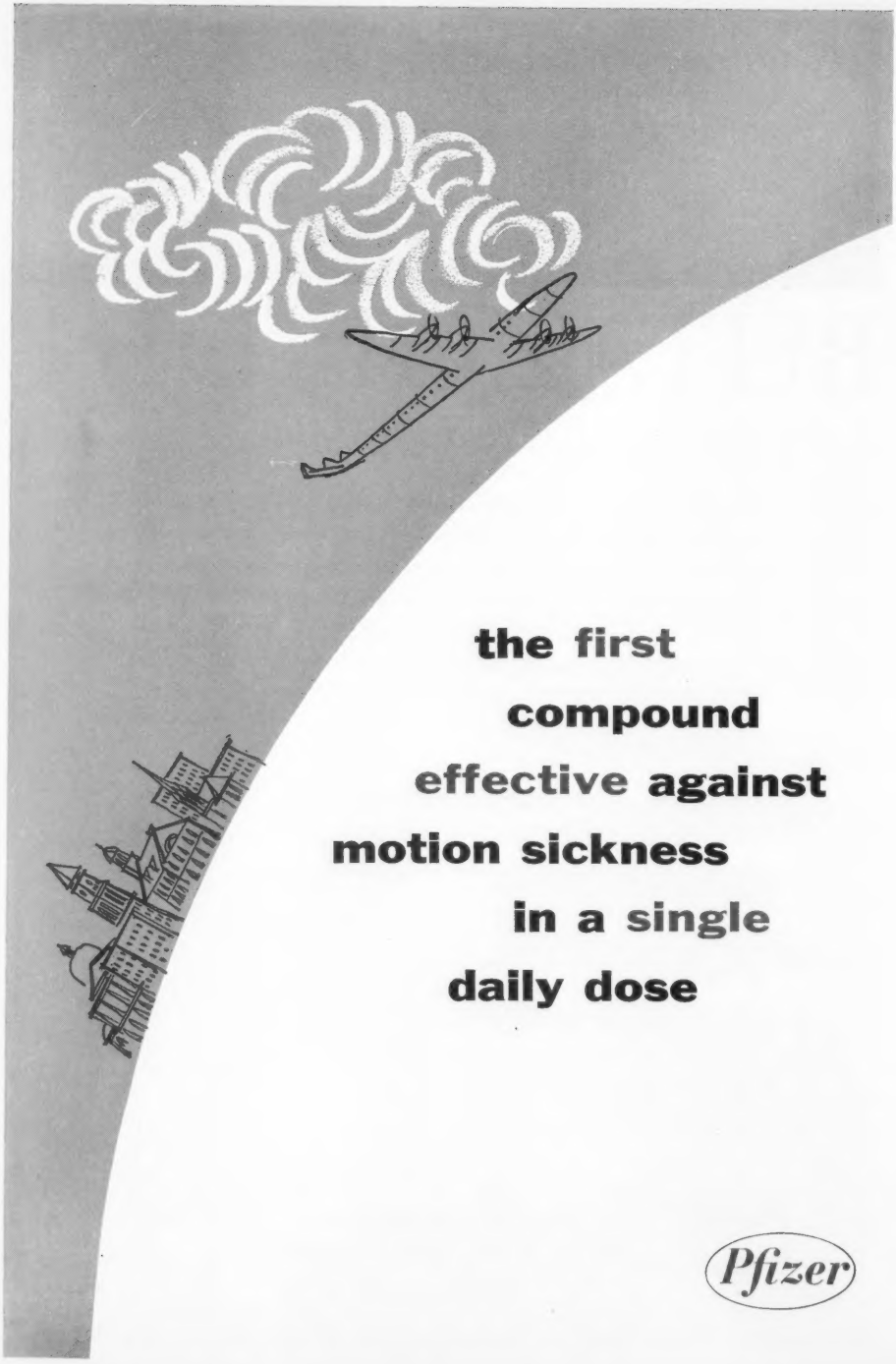
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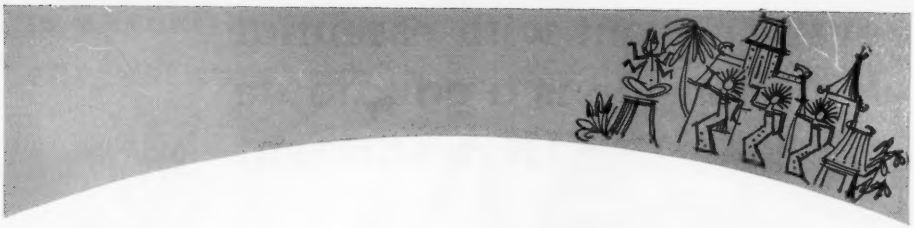

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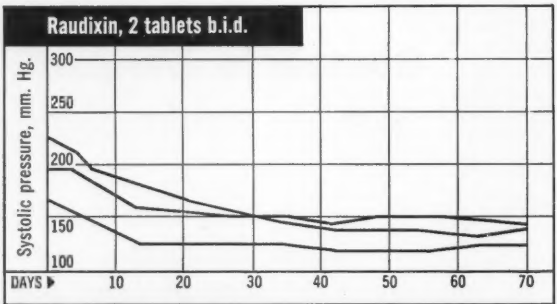

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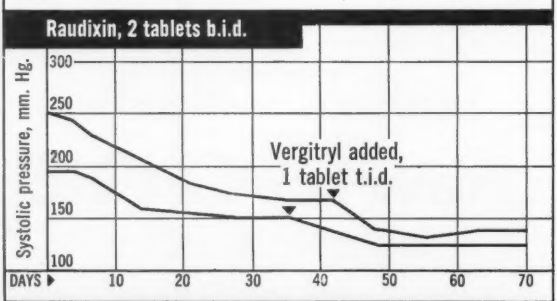
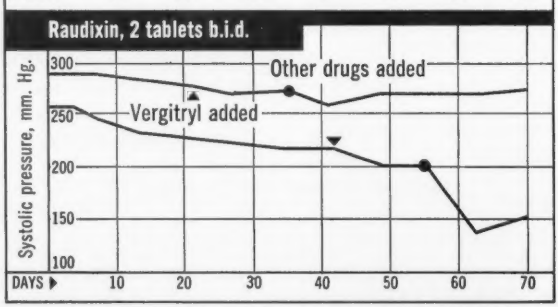


step 3

For the few patients resistant to this combined regimen, a more potent drug may be added, for example, Bistrium (hexamethonium). The most potent drugs, which are potentially dangerous, are thus used only as a last resort in the most refractory cases.



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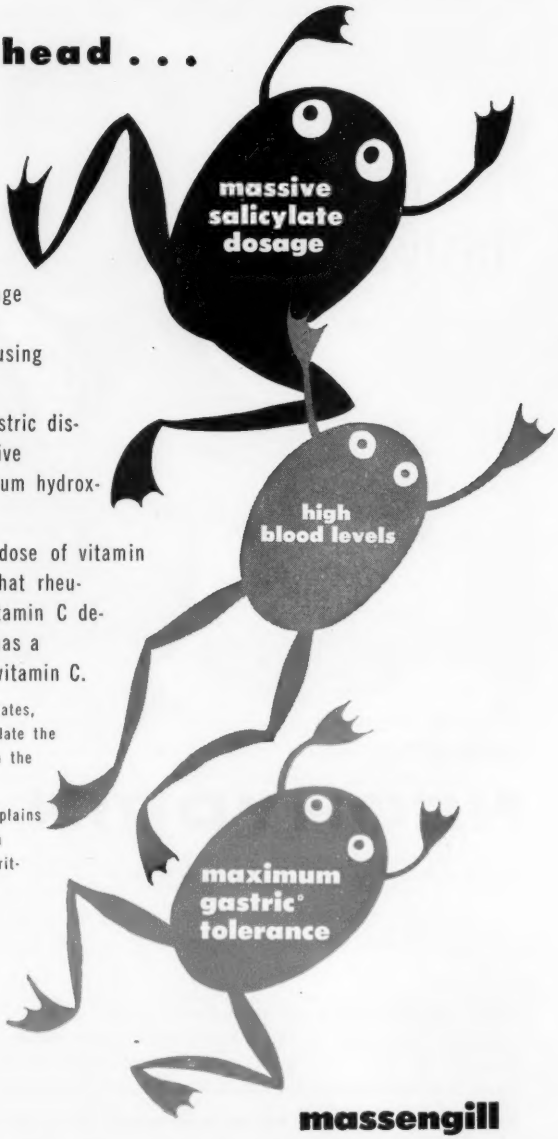
*Proceedings Soc. Exp. Bio. Med., 1952, v80, 51-55, G. Cronheim, et al.



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GERIATRICS

Importance of Collateral Circulation in Obliterative Arterial Disease of the Lower Extremities

Louis G. Herrmann, M.D., *John J. Cranley,* M.D., *and Rosamunde M. Preuninger,* PH.D.

PHYSICIANS interested in geriatrics have a unique opportunity to demonstrate clinically the importance of the collateral arterial circulation in maintaining viability of tissues in limbs with advanced obliterative arterial disease. Routine palpation of the peripheral pulse will reveal that many middle-aged and elderly patients have viable extremities despite the absence of palpable pulsations distal to the femoral artery, or even beyond the bifurcation of the aorta. This observation is of basic significance because it emphasizes an aspect frequently overlooked in the pathologic physiology of this disease and demonstrates nature's compensation for arteriosclerosis obliterans.

In considering peripheral arteriosclerosis obliterans, the pathologic process within the major arteries must be distinguished from the overall arterial circulation of the extremities. These two processes are not necessarily inseparable. The major arteries are obliterated by a diffuse, progressive encroachment of their lumina by the proliferative process itself and by intra-arterial

LOUIS GEORGE HERRMANN, *a graduate of Washington University School of Medicine in 1924, serves as associate professor of surgery at the University of Cincinnati and as director of the vascular disease service of the Cincinnati General Hospital and the Christian R. Holmes Hospital of the University of Cincinnati.* JOHN JOSEPH CRANLEY, JR., *a graduate of Columbia College of Physicians and Surgeons in 1944, is instructor in surgery at the University of Cincinnati.* ROSAMUNDE MAGDALENE PREUNINGER, *who received her Ph.D. from Brown University in 1941 is research associate at the Lucie Rawson Laboratory for Vascular Research at the University of Cincinnati.*

thrombosis. At the present time, little can be done to halt or reverse this progressive arterial obliteration, yet clinical experience has shown repeatedly that even complete obliteration of the major arteries does not necessarily result in ischemic necrosis. Therefore, the adequacy of the overall arterial circulation in the presence of major occlusion depends upon the ability of the collateral arteries to assume a sufficient part of the nutritive load necessary for adequate nourishment of the tissues of the feet. Only when the secondary circulation fails to meet this requirement will ischemic necrosis of soft tissues of the extremity occur.

The limb with major arterial obliteration and a fully developed collateral arterial circulation has passed the crisis and is usually safe from the danger of ischemic necrosis, barring severe trauma or infection. This is the basis for the hallowed clinical observation that a viable limb without palpable pulse in the larger arteries at ankle and knee is less apt to become gangrenous than the other limb in which the pulse is readily palpable at these sites.

This suggests strongly that primary therapeutic emphasis should be on the collateral arterial circulation. It is true that some extremities will be found with a localized obstruction in an otherwise patent major arterial tree. In such instances, excision of the obliterated segment with reestablishment of arterial continuity through implantation of an arterial or venous graft is indicated. In our experience, the number of patients in whom such a segmental obstruction can be demonstrated represents an extremely small fraction of the total number who seek relief of symptoms from obliterative arterial disease. The diffuseness of the obliterative process, the tendency for recurrent arterial thrombosis, and the efficiency of the secondary circulation after it becomes fully developed, force one to the conclusion that maximum benefit to the largest number of patients will be obtained by directing primary therapeutic aims toward the enhancement of the collateral arterial circulation.

WHAT, then, can the physician do to aid the natural process of maintaining adequate arterial circulation against the threat of ischemic necrosis in extremities? Logically, there are two approaches which can be pursued concurrently. The first is to reduce the requirement for blood and to eliminate the factors that reduce effective arterial circulation. The second is to increase the amount of blood reaching the extremities.

Foremost among the conservative measures for reducing excessive demand for blood is *avoidance of local heat.* Since heat is the physiologic stimulus for the relaxation of the arterioles, it was not unreasonable that practicing physicians often applied it to ischemic limbs in expectation of increasing arterial circulation. The fallacy of this was emphasized by Starr in 1934[1] and Freeman in 1940.[2] Local heat increases metabolism and therefore demand for blood beyond the capacity of the obstructed arteries to deliver. In addition, the tissues burn more easily because the impaired circulation cannot dissipate the heat effectively. Finally, sensory acuity is frequently diminished in obliterative arterial disease, so that the patient is unaware that his skin is being

burned. To reemphasize, local application of heat to a limb with obliterative arterial disease is one of the most effective means of precipitating gangrene.

Infection increases the requirement of the tissues for oxygen; hence, it must always be given serious consideration in extremities with obliterative arterial disease. Scrupulous foot hygiene pays big dividends in prevention of local sepsis. When infection is present, the sensitivity of organisms grown from exudates of the wounds should be tested against the various antibiotic substances in order to determine the most potent therapeutic weapon. The dose should be larger than that usually employed, because of the local ischemia of the tissues in these patients. The value of bed rest in treatment of infections in extremities with obliterative arterial disease cannot be overestimated; but, as a matter of fact, is frequently grossly underrated.

Freezing cold is injurious to a normal limb, and even moderate cold can cause vasoconstriction in a limb with obliterative arterial disease.[3] Cold causes vasoconstriction reflexly through the autonomic nervous system and, in addition, has a direct vasoconstricting effect on the vessels themselves. Therefore, the limb with obliterative arterial disease should be protected from cold at all times and even after lumbar sympathetic ganglionectomy.

On clinical grounds, it seems certain that the use of tobacco is deleterious to patients with arterial insufficiency due to arteriosclerosis, and it is most probable that it is one of the exciting agents in the active angiitides such as thromboangiitis obliterans. Laboratory evidence to prove this is not available, nor are there sufficient data to permit a categoric statement that it is the vasoconstricting action of nicotine alone that produces the deleterious effect.

THE exact physiologic stimulus for improving collateral circulation is not completely understood. One school teaches that the ultimate stimulus is chemical in nature due to accumulation of metabolites in the tissues; the other, that all changes in the arterial circulation are best explained by purely physical means. But whatever the ultimate cause, there is scarcely any doubt that the proximate mechanisms are purely physical and governed by the same laws that control the motion of all enclosed fluids, specifically, the head of pressure, the peripheral resistance, and the viscosity of the fluid itself.

These three factors, operative in hydraulics, offer three fundamental avenues of therapeutic approach in improving collateral arterial circulation. One avenue, a decrease in the viscosity of the blood, is virtually unexplored at this time. That a significant reduction in viscosity could be obtained without interfering with one of the blood's vital functions is problematical.

If it were possible to elevate the blood pressure without at the same time increasing the peripheral vascular resistance in the limb, it would be possible to augment the blood flow to that limb. The chief obstacle to this approach is the fact that most drugs which elevate blood pressure do so, partially at least, by peripheral vasoconstriction, so that the equilibrium is not significantly altered. A possible direction for research is indicated by the evidence suggesting that ephedrine and some related compounds do not act directly on the

effector organ as does epinephrine, but instead produce their results by inhibiting the enzymatic destruction of the substance liberated by adrenergic nerves, much as eserine inhibits the destruction of acetylcholine.[4,5] If this assumption is correct, these substances might be expected to increase blood flow in a lower extremity following lumbar sympathetic ganglionectomy. It would have its usual effect on the vessels of the rest of the body, but would have no effect on the denervated vessel of the lower extremity, providing that circulating adrenaline was absent, or present in only insignificant amount. In an isolated experiment[6] on one patient who had had a lumbar sympathectomy for obliterative arterial disease, evidence suggested that the blood flow to the extremity was increased by ephedrine. Another patient with severe pain in an ischemic foot following lumbar sympathectomy seemed to obtain temporary relief of pain following the use of ephedrine subcutaneously. Preliminary observations suggest that the magnitude of such an increase in blood flow is not great, but may be sufficient to relieve pain in certain instances or to carry a patient through a critical period. Obviously, elevation of blood pressure is undesirable in patients with hypertensive cardiovascular disease associated with obliteration of the peripheral arteries.

The third avenue of approach, and the one most thoroughly explored to date, has been to decrease the peripheral resistance to the flow of blood. Attempts to do so by physical methods have been tried for more than two hundred years. The most successful application to date has been the use of alternating negative and positive pressure within a boot (passive vascular exercises) as developed in this hospital.[7] During the period of intensive investigation in this laboratory, objective methods of evaluating peripheral arterial circulation were not available, and one had to rely on clinical evidence alone to determine the efficacy of these exercises. Some patients showed dramatic improvement far beyond that which might be expected from conservative therapy alone or from spontaneous recovery. Some did not improve following treatment. In the majority of instances unquestionable benefit was obtained; however, it could not be attributed positively to passive vascular exercise, because general therapeutic measures were employed concurrently. Attempts are again being made to increase the efficiency of this method by enclosing a larger segment of the body, but technical difficulties have been encountered which make it impossible to predict the future of this type of apparatus.

Most attempts to reduce the peripheral resistance have centered in methods of producing vasodilatation. There is no doubt that dilatation of the arterioles reduces significantly the resistance to the flow of blood. Vasodilatation may be produced by physiologic stimulus (heat), by chemical means (vasodilator drugs), by temporary block of the regional sympathetic ganglia or peripheral nerves with a local anesthetic, or by the surgical extirpation of the sympathetic ganglia innervating the affected part.

The literature is replete with conflicting evidence as to the efficacy of the various methods of producing vasodilatation. Much of this confusion comes

from failure to recognize three fundamental facts. (1) Normally, there is a greater degree of vasomotor tone in the lower than in the upper extremities or face.[8] Therefore, vasodilatation in these areas must not be used as a criterion of effectiveness for an agent expected to be useful in the lower extremity with obliterative arterial disease. (2) The difficulty in producing vasodilatation in the normal lower extremities is magnified many times by the presence of obliterative arterial disease, so that many agents which can produce vasodilatation in the normal lower extremities lose their effectiveness in the extremity with obliterative arterial disease. (3) The variable of the extensiveness of the disease must always be considered. An agent that will produce vasodilatation in an extremity with minimal arterial obstruction may be valueless in an extremity with moderate or advanced obliterative vascular disease.

Recently, the literature was reviewed[9] for objective evidence showing whether the various vasodilators are effective in the presence of obliterative arterial disease of the lower extremities. The evidence indicates that many such agents fail to cause vasodilatation even in the *normal* lower extremity and therefore cannot be expected to have an appreciable effect on patients with arterial insufficiency. These include papaverine, pancreatic extracts, calcium gluconate, thiamine chloride, dioxyline phosphate, nicotinic acid, Roniacol Tartrate, aminophylline, SKF 688A, sodium salicylate, hypertonic saline solution and ACTH. Alcohol, Priscoline, and the tetraethylammonium and hexamethonium ions produce vasodilatation in the normal lower extremity, but their effect becomes inconstant, insignificant, or is absent in patients with obliterative arterial disease of the lower extremities.

If the only objection to these drugs were their ineffectiveness, one would be encouraged to search for new and more potent agents. Unfortunately, the more potent agents defeat their own purpose, in that the pathologic process is more or less limited to the extremities, and the drug's action on the vascular system is widespread. If the drug is potent enough to relax the arterioles, it will necessarily have a greater effect on the areas of the body in which the vascular tree is relatively normal than on the lower extremities in which the arterioles have greater tone and the arteries are obstructed. Widespread vasodilatation reduces the peripheral resistance to blood flow in the face, upper extremities, thorax, and abdomen much more than in the lower extremities with which one is usually concerned. Therefore, there appears little likelihood that a chemical agent will be found that will effect significant improvement in the circulation of the lower extremity with obliterative arterial disease, unless one can be obtained whose action is limited to the involved extremities.

INJECTION of a chemical agent into the main artery of the affected extremity circumvents the undesirable effect that follows oral or the usual systemic administration. Mufson[10] has used histamine in this manner and reports no difficulty due to injury to the artery originating from the injection itself. He measured the efficacy of intra-arterial histamine and various other drugs by

recording the uptake of radioactive sodium in the muscle of the extremity following intravenous injection of this material into the arm. As indicated elsewhere,[9] this method appears to be valid when a negative result is obtained. That is, it is reasonable to conclude that a drug has no significant effect on the arterial circulation of an extremity if, following its administration, the uptake of radioactive sodium is unaltered. Unfortunately, a positive result does not carry the same weight of conviction. The increase in uptake of radioactive sodium observed following intra-arterial histamine might be evidence of an increased rate of blood flow; it could also indicate an increase in venous stasis, or an increased capillary permeability. Weiss, Robb and Ellis[11] concluded that in man, histamine has a greater effect upon the venules and capillaries than upon the arterioles. The distortion of the results of this experiment produced by an increased venous stasis could be eliminated if the extremity were elevated at an angle of 30 degrees from the horizontal during the testing period. This might also reduce, although not necessarily eliminate, the accumulation of radioactive sodium in tissues caused by increase in permeability of the capillaries.

It is possible that the apparent improvement following intra-arterial histamine is actually due to capillary engorgement as brought about by an increase in venous stasis. Even without an increase in blood flow, clinical evidence suggests that an increase in capillary engorgement is of some benefit in selected patients. This would seem to be the mechanism responsible for the improvement following use of intermittent venous occlusion in patients with acute arterial obstruction, or following use of estrogenic hormones, which cause capillary dilatation,[12] and for the relief of pain in the ischemic foot obtained by placing it in a pendent position.

LUMBAR sympathetic ganglionectomy is the best means now available for effecting a long-acting, localized peripheral vasodilatation. In a group of patients with advanced obliterative arterial disease studied before and after lumbar sympathectomy, the average temperature of the great toe was 71.8° F. preoperatively, and 88.8° F. postoperatively under the same controlled conditions. Skin temperature following sympathectomy compared favorably with that obtained following tibial nerve block (82.9° F.) and the highest temperature reached by the toe after induction of general anesthesia (86.1° F.) just prior to sympathetic denervation of the part.[13]

This vasodilatation selectively reduces the resistance to blood flow in the area of the body which needs it and does not alter the vascularity of normal parts of the body. True enough, this increase in rate of flow is not entirely nutritive as some of it is shunted from the arteries to the veins without traversing the capillaries. But the overall clinical picture appears to be one of steady improvement in nutrition of the limbs following lumbar sympathectomy in *properly selected cases*. It is highly probable, therefore, that this prolonged vasodilatation in some way favorably influences the development of the collateral arterial circulation.

CONCLUSIONS

1. The fact that many patients with complete obliteration of the major arteries have a viable extremity proves the potential efficiency of the collateral arterial circulation and points out the locus for primary therapeutic emphasis.

2. Conservative measures helpful in preventing the serious consequences of peripheral arterial disease include avoidance of local heat and extremes of cold, prevention and energetic treatment of infection, and abstinence from the use of tobacco in all forms.

3. The most promising methods of increasing blood flow in extremities center around the reduction of the peripheral resistance to the flow of blood; the most effective method of accomplishing this is by dilatation of the arterioles.

4. Medicinal agents for producing vasodilatation have a fundamental disadvantage in not being selective—a handicap that cannot be overcome by developing more potent vasodilators, unless one is found that will act on the lower extremities alone.

5. Lumbar sympathetic ganglionectomy is the most effective method of producing permanent vasodilatation in a localized area. This vasodilatation appears to have a beneficial effect that increases with the passage of time following operation and in some way influences the development of a more efficient collateral arterial circulation.

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Primary Inguinal Hernioplasty in Geriatrics

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GREAT progress has been made in the field of primary inguinal hernioplasty in the past ten years. Several excellent methods of repair have been evolved which carry a low recurrence rate.[1-15] A better knowledge of the surgical anatomy involved and greater utilization of the anatomical structures as they exist in each case have aided in bringing about a constant reduction in the recurrence rate. Recent articles on the anatomy of the inguinal region have contributed to making many of the presently accepted technics more effective.[16-19]

This report is based upon a recent study of 543 unselected consecutive male patients upon whom 604 operations for primary repair of an inguinal hernia were performed at the Des Moines Veterans Administration Hospital during the past six years. In 61 patients, or 11.2 per cent, the hernias were bilateral, but in none of the cases was a bilateral hernioplasty performed as a one-stage operation. The opposite side was repaired between the seventh and tenth postoperative days. Past experience has shown that when a bilateral repair is done simultaneously, the recurrence rate is three times as great as when performed in separate stages.

Ages ranged from 50 to 76 years, with 430 patients in the 50 to 59 year age group, 104 in the 60 to 69 year group, and 9 in the group over 70.

The hernias in this series included all types: 45 per cent were direct or combined; the remaining were indirect, and less than one per cent were sliding in type. Several patients were operated upon at the time of incarceration or strangulation.

In 90 per cent of the patients a spinal anesthetic was the anesthesia of choice, and in the remaining a general anesthesia was used. A nonabsorbable suture material was employed in the entire series; silk suture was used in 82 per cent, and in the remaining number, cotton.

The operations were performed by 37 different members of the full-time and house staffs, using the same basic repair technic.

OPERATIVE TECHNIC

THE technic used is a modification of the combined procedures of Bassini,[14] Halsted,[18] and Andrews.[20] However, several important steps in the procedure

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were evolved as a result of our own studies. The basic principles in the repair as described by the pioneers in this field are utilized, but no muscle is included in reformation of the floor in Hesselbach's triangle as originally described by both Bassini and Halsted.

An oblique skin incision is made beginning just above the pubic spine and extending upward to and about 5 cm. medial to the anterior-superior iliac spine. The external oblique aponeurosis is split in the direction of its fibers along the medial side of the cord (figure 1). This division results in an adequate medial and lateral leaf which is important in the final stages of repair.

The cord structures are then displaced laterally out from their bed. A complete and accurate dissection of the indirect sac of the cord is carried out high in the internal ring. If an associated direct weakness or sac is present, it is pulled up with the indirect sac converting the hernia into one sac. The direct sac is carefully and completely dissected free from all the surrounding structures, including the urinary bladder. If an indirect sac is not present, the direct sac is picked up in the upper portion of Hesselbach's triangle. In many of our cases, a combined type of hernia was found (figure 2).

A high ligation of the sac is carried out, usually by means of a purse-string suture, and the excess portion of the sac excised. In all cases, whether or not there is a direct hernia or weakness in Hesselbach's triangle, interrupted imbricating sutures of No. 000 silk are taken in the transversalis fascia. Correcting the laxity of this structure helps to form a solid foundation for the hernia repair. Usually 3 sutures in this area are sufficient (figure 3).

Since most recurrences develop in a defect immediately behind and superior to the pubic spine and at the internal ring, steps are taken to fortify these areas by placing a suture of No. 00 silk over the pubic spine as a pulley stitch (figures 3 and 4).

The lower border of the internal ring is formed by placing a horizontal mattress suture of No. 00 silk approximating the free rolled edge of the internal oblique to the shelving edge of the inguinal ligament. The upper border of the ring is formed by suturing the internal oblique aponeurosis to the inguinal ligament superior to the cord structures. The size of this ring is made to accord with the size of the cord and its structures. In none of our cases was it large enough to permit the entrance of the tip of the little finger. We believe the ring should be *small*, and that it is adequate in size if it will receive the large end of an ordinary-sized thumb forceps (figure 4).

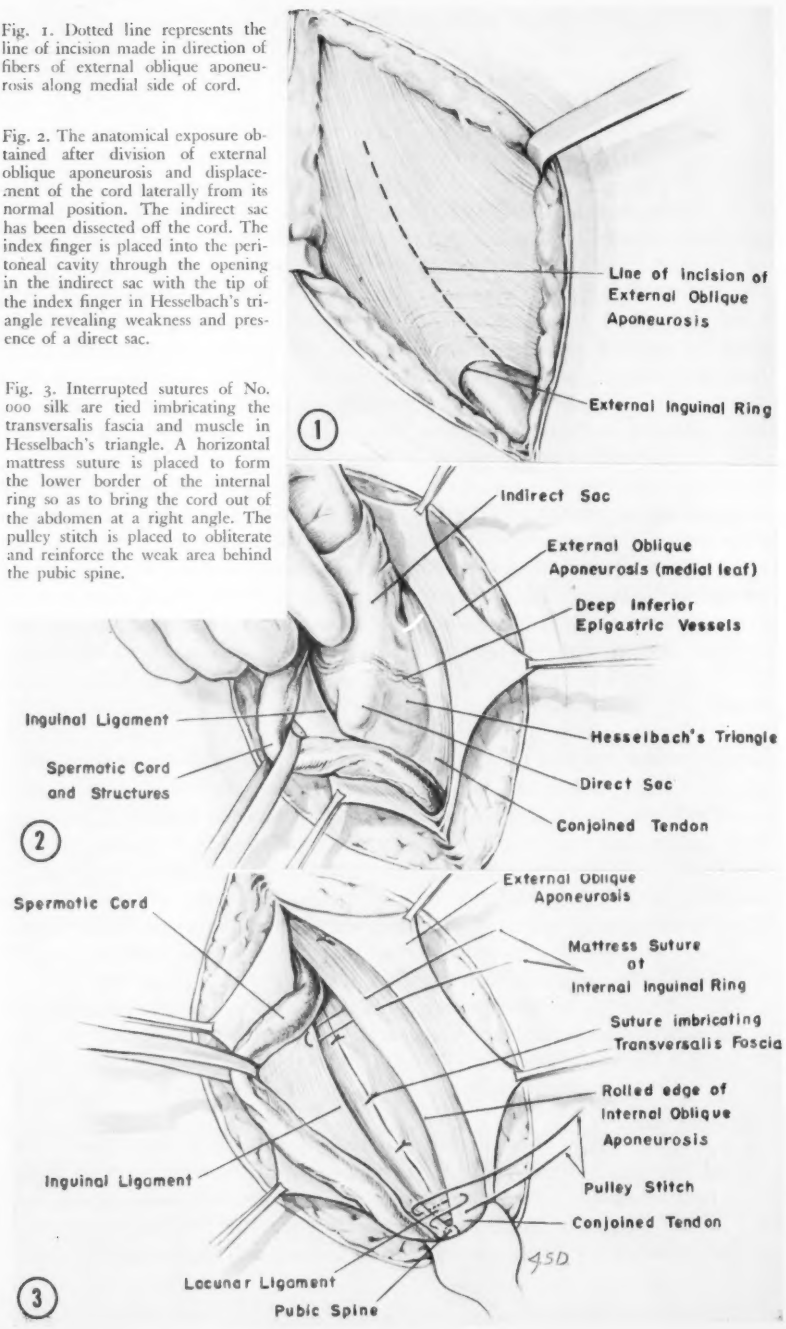
The rolled edge of the internal oblique aponeurosis is approximated to the inguinal ligament below and above the cord, using interrupted No. 00 silk sutures (figures 4 and 5). These sutures are placed without tension and tied so as to approximate the tissues without tension or without producing strangulation.

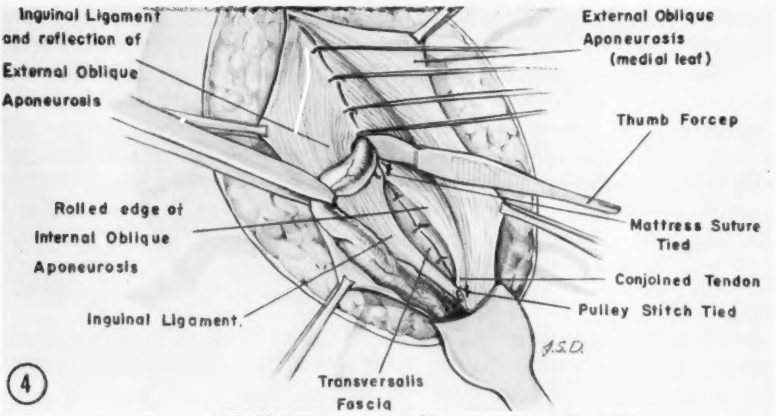
The lateral leaf of the external oblique aponeurosis is split toward the inguinal ligament at right angles to its fibers about three-fourths of an inch, or 1.9 cm., below the lower border of the newly formed internal ring (figure 5). The divided medial and lateral leaves of the external oblique aponeurosis inferior to the internal ring are imbricated and sutured to the newly formed

Fig. 1. Dotted line represents the line of incision made in direction of fibers of external oblique aponeurosis along medial side of cord.

Fig. 2. The anatomical exposure obtained after division of external oblique aponeurosis and displacement of the cord laterally from its normal position. The indirect sac has been dissected off the cord. The index finger is placed into the peritoneal cavity through the opening in the indirect sac with the tip of the index finger in Hesselbach's triangle revealing weakness and presence of a direct sac.

Fig. 3. Interrupted sutures of No. 000 silk are tied imbricating the transversalis fascia and muscle in Hesselbach's triangle. A horizontal mattress suture is placed to form the lower border of the internal ring so as to bring the cord out of the abdomen at a right angle. The pulley stitch is placed to obliterate and reinforce the weak area behind the pubic spine.





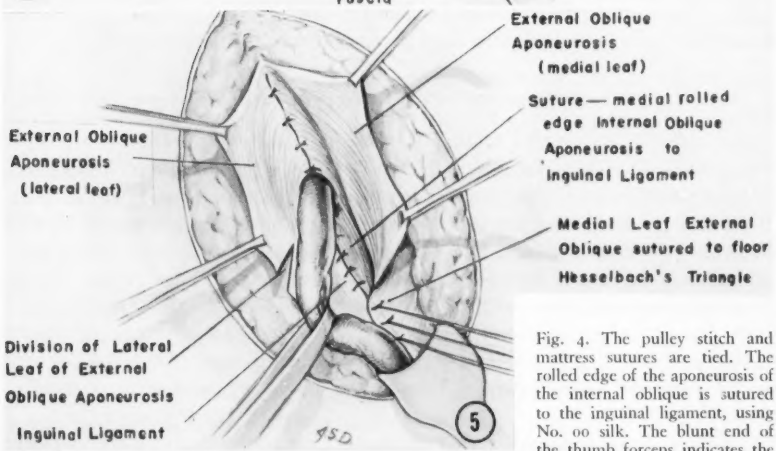

External Oblique Aponeurosis (medial leaf)
Suture— medial rolled edge Internal Oblique Aponeurosis to Inguinal Ligament
External Oblique Aponeurosis (lateral leaf)
Medial Leaf External Oblique sutured to floor Hesselbach's Triangle
Division of Lateral Leaf of External Oblique Aponeurosis
Inguinal Ligament
5

Fig. 4. The pulley stitch and mattress sutures are tied. The rolled edge of the aponeurosis of the internal oblique is sutured to the inguinal ligament, using No. 00 silk. The blunt end of the thumb forceps indicates the relative size of the internal ring.

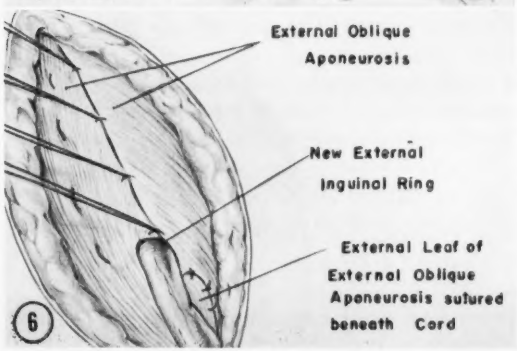

External Oblique Aponeurosis
New External Inguinal Ring
External Leaf of External Oblique Aponeurosis sutured beneath Cord
6

Fig. 5. The second layer of aponeurosis to aponeurosis repair. The aponeurosis of the internal oblique or conjoined tendon is sutured to the shelving edge of inguinal ligament in Hesselbach's triangle using No. 00 silk. The lateral leaf of external oblique aponeurosis is divided transversely for a short distance ¾ inch below lower border of the internal ring. The medial cut leaf of external oblique aponeurosis is sutured to the floor of Hesselbach's triangle using No. 000 silk.

Fig. 6. The cut medial and lateral leaves of the external oblique aponeurosis are imbricated beneath cord in region of Hesselbach's triangle using No. 000 silk. The cut leaves of the same structure are sutured above cord with interrupted sutures of the same size. The cord has been transplanted subcutaneously above external oblique aponeurosis and the newly-formed inguinal canal is now only ¾ inch in length as compared to a former length of 2 to 2½ inches.

floor of Hesselbach's triangle, using interrupted sutures of No. 000 silk (figures 5 and 6). This step completes a 4-layer repair in Hesselbach's area.

The new external inguinal ring is formed three-fourths of an inch, or 1.9 cm., inferior to the internal inguinal ring by suturing the divided leaves of the external oblique aponeurosis above the cord. The operation is completed by reapproximating the cut leaves of the external oblique aponeurosis superior to the cord, using interrupted sutures of No. 000 silk (figure 6). The superficial fascia is closed over the cord with interrupted No. 0000 silk and the skin with mattress and interrupted No. 000 silk.

POSTOPERATIVE COMPLICATIONS

There were 36 postoperative complications, an incidence of 5.9 per cent. Eleven, or 1.8 per cent, occurred in the wound; 3 were infections; 4 were hematomas; and 4, sinuses from silk sutures. Ten, or 1.7 per cent, were pulmonary complications: 7, atelectasis and pneumonia; 2, upper respiratory infections; and 1, an embolism. In 4 patients thrombophlebitis developed.

EFFECTS OF EARLY AMBULATION

The effects of early ambulation upon the complication rate was studied.[21-35, 18, 19] This includes our own series, the results of which are given later. Patients were divided into 3 groups depending upon the day of ambulation; all were unselected and consecutive. There was a progressive and decided decrease in the number and type of complications in the patients given early ambulation. In fact, those given late ambulation had a 6 times greater chance of developing complications than those ambulatory on the first postoperative day. The complication rate fell progressively when bed stay was decreased, incidence being 19.5 per cent in the patients in bed fourteen days, 9.4 per cent for those in bed seven days, and 3.6 per cent for those ambulatory on the first day (table 1).

Repeated catheterizations were necessary postoperatively in 6.9 per cent of the late ambulatory patients as compared to only 0.4 per cent in those ambulatory on the first day.

Death occurred on the eighth postoperative day in a 71-year-old male, who had a left sliding hernia repaired, as a result of bilateral femoral emboli and coronary occlusion. This represented a mortality rate of 0.1 per cent.

RESULTS

A one to six year follow-up was obtained in 86.8 per cent of the patients. There were 8 recurrences, a rate of 1.3 per cent in the group in which a followup was obtained.

Effects of early ambulation upon the recurrence rate were also studied. Patients were divided into groups as noted in table 1. Group A, with 47 patients ambulatory on the fourteenth postoperative day, was followed from five to six years with one recurrence, or 2.1 per cent. Group B, with 116

TABLE 1
POSTOPERATIVE COMPLICATIONS IN RELATIONSHIP TO AMBULATION

Type	Group A 47 patients ambulatory 14th day postoperative		Group B 116 patients ambulatory 7th day postoperative		Group C 441 patients ambulatory 1st day postoperative		Totals 604 Patients	
	Number	%	Number	%	Number	%	Number	%
Pulmonary								
Atelectasis and pneumonia	2	4.2	4	3.4	1	0.2	7	1.1
Upper respiratory infection	1	2.1	0		1	0.2	2	0.3
Embolism	0		1	0.8	0		1	0.1
Wound								
Hematoma	0		2	1.7	2	0.4	4	0.6
Infection	1	2.1	1	0.8	1	0.2	3	0.4
Sinus, silk suture	0		2	1.7	2	0.4	4	0.6
Coronary infarction	1	2.1	0		0		1	0.1
Emboli, femoral	0		0		1	0.2	1	0.1
Epididymitis, left	0		0		1	0.2	1	0.1
Shock	0		1	0.8	0		1	0.1
Testicle, swelling	2	4.2	0		5	1.1	7	1.1
Thrombophlebitis, acute	2	4.2	0		2	0.4	4	0.6
Totals	9	19.5	11	9.4	16	3.6	36	5.9

patients ambulatory on the seventh postoperative day, was followed four to six years with no recurrences. Group C, with 441 patients ambulatory on the first postoperative day, was followed three to six years with 7 recurrences, or 1.38 per cent. In a total of 604 operations, there were 8 recurrences, a rate of 1.3 per cent.

Since most current reports show that 80 to 90 per cent of recurrences appear during the first two years following primary repair for inguinal hernias, we believe that the study of our series and a report of our findings is valid since the majority of these cases have been followed for more than three years.[2, 12] In fact, 7, or 87 per cent, had a recurrence in less than two years. In 4 of these cases, ranging in age from 52 to 59 years, preoperative and postoperative conditions were not conducive to the repair remaining intact. In 3 of these, chronic pulmonary disease with an associated chronic cough was responsible for breakdown. In the fourth case, the patient returned on the tenth postoperative day to his work as a truckdriver, a job involving heavy lifting and straining. It may be assumed that the recurrences in 4 of the 8 cases might not have occurred under more favorable circumstances.

The recurrence rate was low in all 3 groups studied. Early ambulation effected a marked reduction in the postoperative complication rate but did not increase the recurrence rate. In fact, the early ambulation group showed a lower recurrence rate than the group ambulatory on the fourteenth postoperative day.

Patients were instructed to refrain from heavy lifting, straining, or athletics for six to eight weeks postoperatively. They were permitted to return to sedentary work at the end of two weeks.

SUMMARY AND CONCLUSIONS

The results of a study of 543 unselected consecutive male patients ranging in age from 50 to 76 years, upon whom 604 primary inguinal herniorrhaphies were performed, are presented.

A follow-up was obtained in 86 per cent over a period of from three to six years. There were 8 recurrences, a rate of 1.3 per cent.

A combined modified Bassini, Halsted, and Andrews operation, using either cotton or silk sutures, is described with diagrammatic illustrations.

The complication rate dropped from 19.5 per cent in the late ambulatory group to 3.6 per cent in the early ambulatory group. Postoperative mortality was 0.1 per cent. It appears from these studies that early ambulation effected a marked reduction in the postoperative complications without increasing the recurrence rate and aided in a more rapid rehabilitation of the patient.

Herniorrhaphy in patients over 50 can now be performed safely with a minimal risk to the patient and assurance of a low recurrence rate.

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Bronchogenic Carcinoma With Emphasis on Early Diagnosis

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BRONCHOGENIC carcinoma is increasing more than any other cancer in the body, a phenomenon which cannot be accounted for by the greater longevity which is responsible for the increase in the general incidence of cancer. From 1938 to 1948, deaths from all types of cancer rose from 149,214 to 195,594 (31 per cent) and deaths from bronchogenic carcinoma from 6,732 to 19,450 (144 per cent).

Cancer of the lung is primarily a disease of older people. In a series of 1,122 cases of proved bronchogenic carcinoma which we have seen,[1] the largest number (38 per cent) were in the sixth decade. Thirty per cent were between 60 and 69, 19 per cent between 40 and 49, 7 per cent between 70 and 79, and 5 per cent between 30 and 39. Bronchogenic carcinoma, therefore, becomes an extremely important factor in older persons. It is primarily a disease of males. In our series, 89 per cent of the patients were men and only 11 per cent were women. The white race is affected somewhat more frequently than the Negro race. In the Charity Hospital in New Orleans, to which white and Negro patients are admitted with about equal frequency, bronchogenic carcinoma represented 172 per hundred thousand admissions in the white race as compared with 124 per hundred thousand admissions in the Negro.

Bronchogenic carcinoma can be divided into 3 histologic types: epidermoid, undifferentiated, and adenocarcinoma. Epidermoid carcinomas represent the largest group. In our series of 371 pulmonary resections for bronchogenic carcinoma, epidermoid carcinoma was found in 52.6 per cent, an undifferentiated lesion in 23 per cent, and an adenocarcinoma in only 19 per cent. Adenocarcinomas occur relatively more frequently in women than in men. Of the 326 men with bronchogenic carcinoma, 57 per cent had epidermoid carcinomas, 28 per cent undifferentiated, and only 15 per cent adenocarcinoma. Of the 46 women with this condition, only 22 per cent had epidermoid, 28 per cent undifferentiated, and 50 per cent adenocarcinoma.

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Most bronchogenic carcinomas are located in the upper lobe bronchi. In the series of 371 resected cases, the upper lobe bronchi were involved in 56 per cent, the left upper lobe in 29 per cent, and the right upper lobe in 27 per cent. The fact that the upper lobe bronchi are more frequently involved is important diagnostically since tumors in this location are difficult to visualize bronchoscopically and may sometimes be responsible for late diagnosis.

Symptoms of bronchogenic carcinoma are those of complications. Not until there is a breakdown of the tumor or obstruction of the bronchus by tumor are symptoms likely to be present so that the complicating lesion, such as pneumonitis, atelectasis, or ulceration, is likely to be treated without thought of the possibility of a bronchogenic neoplasm. Not infrequently, the first manifestation of such a neoplasm is a pneumonitis from obstruction of the bronchus resulting in bronchial stasis. Since this runs an atypical course, it is frequently considered an atypical pneumonia. Since viral pneumonia is also an atypical pneumonia, much too frequently a pneumonitis associated with bronchogenic carcinoma is thought to be a viral pneumonia, and the patient is treated with antibiotics for varying periods with some degree of improvement. The antibiotics relieve the secondary infection resulting from bronchial obstruction, giving patient and physician a false sense of security as they believe that a curative therapy is being accomplished. Although viral infection and atypical pneumonia may occur in a man past 40, the possibility of a bronchogenic cancer must be considered in all such patients and the proper diagnostic procedures employed.

Cough is a frequent manifestation of bronchogenic carcinoma, but since it occurs frequently in all smokers, is likely to be disregarded. A change in the character of cough is significant. Hemoptysis, the result of ulceration, also demands attention. Wheezing means bronchial obstruction, and when it occurs in a person with no previous thoracic discomfort or asthma, suggests a malignant neoplasm. Finally, thoracic discomfort in a person who had no such symptoms previously is suggestive and demands investigation.

The late manifestations of bronchogenic carcinoma are those of sequelae, such as fever, pain, digestive disturbances, and emaciation. Usually they represent inoperability or extent of the disease. Cough was present in 89 per cent of our cases, weight loss in 70 per cent, chest pain in 66 per cent, hemoptysis in 65 per cent, and respiratory infection in 54 per cent.

Diagnosis of bronchogenic carcinoma is not difficult if consideration is given to its possible presence and steps taken to prove or disprove its existence. Roentgenography is the most valuable diagnostic method because of the ease with which it is done and because of the high incidence of positive findings. A tumor large enough to produce a shadow in the lung field can be seen on roentgenograms and should always arouse suspicion. Although roentgenographic diagnosis is only presumptive, it calls attention to a lesion of the lung and suggests the need for additional investigation. A tumor, which is not

large enough to obstruct the bronchus completely, permitting air to get beyond the tumor during inspiration as a result of dilatation of the bronchial tube, yet not permitting air to get out during expiration because of contraction of the bronchus, will cause localized obstructive emphysema. This condition, indicating incomplete bronchial obstruction, suggests bronchogenic neoplasm, and if it occurs in a man past 40, usually means carcinoma. In those cases in which the tumor fills the bronchus completely, absorption of air occurs distal to the obstruction and results in an atelectasis with displacement of the mediastinum toward the affected side and elevation of the diaphragm on that side. Bronchography may be of value in locating peripheral lesions and, in cases of bronchial obstruction, can demonstrate the obstruction. But again, diagnosis of bronchogenic carcinoma is only presumptive.

Positive diagnosis of bronchogenic carcinoma can be made only by demonstrating carcinoma cells in material obtained from the bronchus. Bronchoscopy, therefore, is indicated in all cases in which carcinoma is suspected. Unfortunately, over half the bronchogenic carcinomas occur in the upper lobe and occasionally in the periphery, so that the lesion is often beyond bronchoscopic vision. In our series, diagnosis was made by bronchoscopic examination in only 36 per cent of cases.

Careful cytologic examination of the sputum is extremely important in diagnosis. It makes little difference if the material is obtained by aspiration during bronchoscopy or by expectoration, as the finding of tumor cells makes a positive diagnosis of bronchogenic carcinoma. In our experience, examination of sputum is more valuable than examination of material aspirated during bronchoscopy, for sputum is easy to obtain and examinations can be made much more frequently. In 68 per cent of our cases, a positive diagnosis of bronchogenic carcinoma was made on cytologic examination of the material obtained from the bronchi.

Thoracoscopic examination is of value as a prognostic, but not as a diagnostic procedure. In any person in whom there is a possibility of spread beyond the lung to the pleura, such extension can usually be demonstrated by a thoracoscopic examination. It is used for diagnosis only in those cases in which there is a possible pleural extension. Aspiration biopsy is an excellent diagnostic method for peripheral lesions, but we are opposed to it because of the danger of implantation of tumor cells along the course of the aspirating needle. Since we feel that curability is definitely less when aspiration biopsy is used, we use it only in those cases which are obviously inoperable, but in which we want to obtain a positive diagnosis.

Unfortunately, positive diagnosis can be made in only 80 per cent of cases preoperatively. In approximately 20 per cent it is necessary to use thoracic exploration, which we believe is a perfectly justifiable procedure when the diagnosis cannot be excluded otherwise. At the time of exploration, a biopsy of the lesion, segmental resection, or lobectomy can be done, the section can be frozen immediately and the presence or absence of malignant disease determined as a guide to subsequent therapy.

THE ONLY curative treatment of bronchogenic carcinoma is the removal of the entire involved lung together with an en bloc dissection of all the mediastinal lymph nodes. Before such a procedure is done and particularly in older individuals in whom pulmonary function may be diminished, careful pulmonary function studies must be made to determine whether the patient can tolerate a pneumonectomy. Only in those patients who could not tolerate such radical surgery is any operation short of a pneumonectomy permissible.

In our series of 1,122 cases of proved bronchogenic carcinoma, 43 per cent were obviously inoperable when first seen; 639, or 57 per cent, were considered operable, of which 9 per cent refused surgery; 582, or 52 per cent of the entire group, were explored, of which 210, or 36 per cent, were found to be nonresectable. Of this group, 18 per cent died within the hospital. Three hundred seventy-two (64 per cent of those explored and 33 per cent of the entire group) were resected, of which 20 per cent died within the hospital, and 296 were discharged from the hospital. The mortality rate of 20 per cent probably demands some explanation, for many will consider it far too high. Obviously, the mortality rate following pneumonectomy for bronchogenic carcinoma can be adjusted as one wishes if only those cases are selected which have minimal disease and which are exceptionally good risks. On the other hand, palliative resection of the lung for bronchogenic carcinoma is justified just as resections for lesions of the stomach and colon are justified, even though there are metastases to the liver. The fact that the patient is relieved of symptoms caused by suppuration and bronchial obstruction and that his remaining days are comfortable is enough justification for a palliative procedure. In our series of 372 resections, palliative resections—that is, surgery in cases in which the lesion had extended beyond the lung—were done in 74 per cent. These palliative measures obviously necessitated more extensive surgery. In 36 of the series, ligations were made within the pericardium; in 15, resection of a major portion of the chest wall was performed; in 13, sutures were placed in the antrum; in 12, a large portion of the diaphragm was excised; and in 1, partial excision of the superior vena cava was done. In the 372 resected cases, there were 77 deaths, of which 45 per cent were cardiovascular, 32 per cent respiratory, 16 per cent hemorrhagic, and 8 per cent due to other causes.

THE present outlook in treatment of bronchogenic carcinoma based on current statistics is not good. Only an approximate 6 per cent of all our patients with bronchogenic carcinoma are alive at the end of five years. However, of the resected cases, 15.2 per cent are alive at the end of five years as compared with 85.4 per cent of the general population. In the group with no resection, no patient lived beyond three years, showing the value of resection.

Of those treated palliatively, 7.2 per cent are alive and 36.2 per cent of those in whom the lesion was apparently localized to the lung are alive at the end of five years. Thus, despite the fact that 75 per cent of the cases of bronchogenic carcinoma were extensive, the salvage rate is still worthwhile. The low operability incidence is undoubtedly due to the fact that in many cases

there was a delay before a diagnosis was made and definitive therapy started. In our series, up to 1941 there was a delay of 9.9 months; from 1942 to 1946, 9.6 months; and from 1947 to 1951, 8 months. That the delay was not alone responsible for the inoperability is illustrated by the fact that in the entire series the delay was 8.7 months; in the resectable cases, 10.5 months; but in the inoperable cases, 7.5 months. This seeming paradox indicates that the slow-growing tumor which produces symptoms over a relatively long period is more amenable to surgical extirpation than the fast-growing variety which produces symptoms early.

In the entire series, patients were responsible for an average delay of 2.8 months in treatment and physicians for an average of 5.5 months. Among the private cases, patients were responsible for a delay of 2.8 months, and physicians for a delay of 6.2 months, as contrasted with the cases in the charity series, in which patients were responsible for a delay of 3 months and physicians for a delay of 3.6 months.

LUNG CANCER is increasing much more than cancer in other viscera, as borne out by the figures on cases determined at autopsy. In 1920, cancer of the lung represented 1.1 per cent of all cancer deaths; in 1930, 2.2 per cent; and 1948, 8.3 per cent. We believe that this unprecedented increase is due to the carcinogenic effect of the residue from cigarette smoking, for there is a distinct parallel between the incidence of this disease and the sale of cigarettes in the United States. The annual production of cigarettes per capita grew from 46.3 in 1903 to 2,541 in 1948. Excluded from the latter figures are those produced for foreign consumption. Graham[2] has demonstrated that the tar residuum obtained from cigarette smoking will produce cancer when applied to the endothelial surface of animals.

It is imperative that all men past 40 who have smoked one package or more of cigarettes a day for twenty or more years have chest roentgenograms, preferably at three-month intervals, so that, if carcinoma occurs, a diagnosis can be made while it is still limited to the lung and before symptoms appear. The value of such detection is illustrated by Overholt's experience.[3] In a series of cases in which the bronchogenic lesion was detected by routine chest surveys, the resectability incidence was 100 per cent in the group with no symptoms, and 75 per cent in the group in which the lesion was limited to the lung. This is in contrast to our series of cases in which all except 6 had symptoms referable to their cancer. Of this group, 43 per cent were obviously inoperable when first seen, 52 per cent were given exploratory surgery, only 33 per cent were resected, and 26 per cent survived the operation.

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Physiopathology and Therapy of Fluid Disorders in Prostatism

Jack Lapides, M.D.

SUCCESSFUL treatment of prostatism involves the establishment and maintenance of normal fluid and electrolyte balance. Many signs and symptoms in prostatic disease as well as intolerance to prostatectomy are due to fluid and electrolyte abnormalities.[1] Although the majority of prostatics do not exhibit evidence of such disturbances,[2] the present morbidity and mortality observed in treatment of prostatism stems principally from the small group of patients who do have fluid and electrolyte aberrations. In order to treat these patients rationally one must understand the role of the kidney in the pathogenesis of electrolyte disturbances as well as clinical and laboratory evidences of these disorders.

PHYSIOPATHOLOGY

Kidney

From a broad viewpoint, renal function in the normal individual serves to maintain a relatively constant environment for the body cells so that they can work in a normal manner. If renal activity is impaired, abnormalities in the chemical structure of the body fluids appear, resulting in serious disturbances in cellular functions, as manifested by such clinical signs and symptoms as anorexia, nausea, vomiting, anemia, ease of fatigue, stupor, and hyperpnea.

By means of glomerular filtration and tubular function, the kidney screens the blood plasma continuously. The ultimate purposes of the renal nephrons are: excretion of waste products of protein catabolism, such as sulfates, phosphates, urea, creatinine, uric acid, and potassium; retention of materials for anabolism such as glucose and amino acid; maintenance of a normal blood pH of 7.4 by reabsorbing $NaHCO_3$ according to body needs; and maintenance of normal plasma volume by reabsorption of sodium chloride and water.

In prostatism, renal dysfunction is characterized initially by impairment of glomerular filtration. Obstruction of the lower urinary tract by an enlarged prostate results in urinary retention. Accumulation of urine in the bladder raises intravesical pressure which in turn leads to elevation of intraureteral and intrapelvic pressures.[3] The increased pressure is reflected up the infundibula, calyces, and tubules of the nephrons. As shown in figure 1A, normal

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effective glomerular filtration pressure is the result of interaction of forces promoting filtration and forces opposing filtration.[4, 5] The intravascular hydrostatic pressure promotes filtration while intravascular protein osmotic pressure and intrarenal tissue pressure opposes filtration. When intrarenal tissue pressure is markedly increased by urinary retention (figure 1B), effective glomerular filtration pressure is decreased. Glomerular filtration will be impaired further because of decreased blood flow due to compression of blood vessels by the increased intrarenal tissue pressure.[6] Tubular function will also be disturbed[7] because of a decrease in the peritubular capillary blood flow due to compression of the vessels by increased intrarenal pressure.

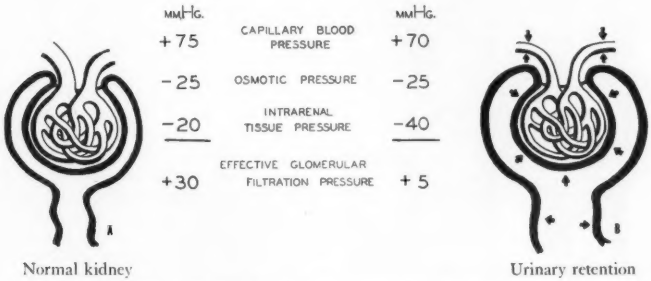

FIG. 1. Plasma electrolyte concentrations (mEq./L.).

If urinary retention is brief, probably no structural changes occur. However, prolonged lower urinary tract obstruction will result, initially, in anemic and pressure atrophy of the tubules. Later, the glomeruli will be destroyed so that the kidneys in the end-stage become connective tissue shells.[8] Experiments in animals[8] have shown that removal of the "back-pressure" will result in structural repair and restoration of function, the degree dependent upon period of obstruction. In man, following drainage of the bladder, glomerular as well as tubular function has improved;[9] the function of the tubules, however, appears to recover to a greater extent. The time needed for maximal improvement may be 1 to 2 months in some cases.

Electrolytes

When glomerular filtration is impaired by "back-pressure," there is a tendency for retention of all substances in the body. However, only those materials which are not needed by the body and which are destined for excretion, such as sulfates, phosphates, and nonprotein nitrogen, accumulate rapidly in the body; the nonprotein nitrogen level is the first to rise. Acidosis results from retention of these products.

The body attempts to buffer these acids by neutralizing them with available base from the sodium bicarbonate in the plasma. Thus serum bicarbonate will be decreased while the acids accumulate. Figure 2A illustrates plasma concentration of the various electrolytes in the normal person and figure 2B

depicts the changes in impaired glomerular filtration. It will be noted that total base is within normal limits.

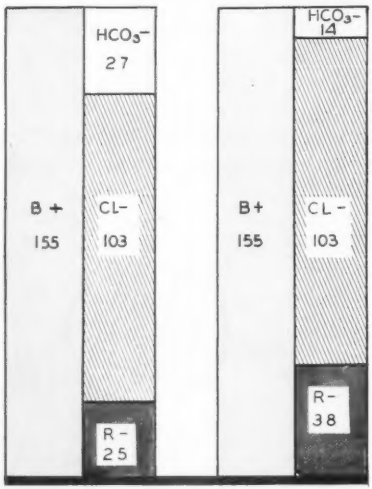

FIG. 2A
Normal kidney

FIG. 2B
Urinary retention

FIG. 2. Diagram showing renal function.

If urinary retention is incomplete and present over a prolonged period, tubular damage will occur. Since the renal tubules perform numerous functions, many abnormalities can result. From a clinical point of view 3 functional abnormalities are important:

1. Damage to the proximal portion of the tubule may cause a so-called "salt-losing nephritis." Despite stimulation by adrenal cortical hormone the tubules fail to reabsorb the necessary amount of sodium chloride and obligatory water from the glomerular filtrate. The net result of this abnormality is a gradual decrease in extracellular fluid volume as is seen in Addison's disease where sodium chloride loss is due to a deficiency of the adrenal cortical hormone rather than tubular cellular damage.
2. In some cases the distal tubule suffers predominantly leading to abnormal distal tubular function. Ability to conserve water and concentrate urine is a function of the distal tubule. With impairment of this process the patient exhibits polyuria as well as a tendency to dehydrate much faster than the normal individual.
3. The distal tubule is concerned also with the conservation of available base. It performs this function by manufacturing hydrogen and ammonium ions which are substituted for sodium ions in the tubular fluid. The sodium ions are returned to the blood as sodium bicarbonate. When this process is impaired, the patient develops hyperchloremic acidosis characterized by elevated plasma chloride and decreased bicarbonate levels.

Thus it will be seen that the electrolyte and fluid abnormalities observed in prostatic patients are not of one type. This observation accords with the findings of Peters and coworkers[10] who found no constant ionic plasma pattern in diseased kidneys of various types.

The clinical and chemical picture of the patient may be further complicated by anorexia and vomiting. The emesis will lead to further depletion of fluid and electrolytes. In addition, failure to eat will increase acidosis by accelerating tissue protein breakdown and by leading to starvation ketosis. Anorexia and vomiting will result in cellular depletion of potassium although serum K may be elevated due to impaired renal function, accelerated tissue breakdown, and dehydration.

TYPES OF FLUID AND ELECTROLYTE DISTURBANCES

Body fluid disturbances may be broken down into 3 categories according to modern concepts:[11] disturbances in ionic composition, disturbances in electrolyte osmolar concentration, and disturbances in volume.

The primary disturbances of ionic composition in urinary retention are increased serum phosphate, sulfate, and decreased serum bicarbonate levels (acidosis). Secondary disturbances may be hypocalcemia and hyperpotassemia.

Disturbances in osmolar concentration of electrolytes refer simply to the total concentration of electrolytes in each liter of extracellular fluid. In the normal individual there are 155 mEq. of anions and 155 mEq. of cations per liter of plasma. Table I depicts the concentrations of the various ions in plasma. In the patient with obstructive uropathy the osmolar concentration

TABLE I

ACID BASE COMPOSITION OF BLOOD PLASMA

(Values in milliequivalents per liter)

Base		*Acid*	
Sodium	142	Bicarbonate	27
Potassium	5	Chloride	103
Calcium	5	Phosphate	2
Magnesium	3	Sulfate	1
		Organic acid	6
	155	Protein	16
			155

may be normal, increased, or decreased. An increased osmolar concentration is seen in the patient who has had urinary retention for a short period and who has not been eating or drinking. Since the patient is losing primarily water, with little or no salt, through skin and lungs, the concentration of electrolytes in each liter of plasma will be increased. A decreased osmolar concentration is encountered in the patient with chronic urinary retention who has advanced tubular damage with salt-losing tendencies and who is drinking water but not eating.

In addition to changes in ionic composition and osmolar concentration, there may be deficits of total extracellular fluid volume or dehydration. Thus, instead of having approximately 12 liters of extracellular fluid, the prostatic patient, by virtue of mechanisms discussed, may only have 8.

DIAGNOSIS OF TYPE OF FLUID DISORDER

Evaluation of fluid and electrolyte status should include consideration of the patient's history, physical findings, and laboratory data. In all prostatic patients, there will be the usual history of difficult urination which may or may not be associated with nausea, anorexia, vomiting, ease of fatigue, dyspnea, and weakness.

Physical findings in fluid disorders will vary with the type of abnormality. Acidosis may be manifested as hyperpnea and dyspnea on slight exertion if the acidosis is uncompensated. If it is compensated, there may be no clinical signs. Blood chemistry studies will reveal a decrease in the CO_2-combining power, the normal being 27 mEq./L. or 60 volumes per cent. It is important to note that increased respiration and a low CO_2-combining power may also be found in cases of respiratory alkalosis resulting from brain lesions.

Determination of blood pH will establish the correct diagnosis, the pH being decreased in metabolic acidosis and increased in respiratory alkalosis. However, since many hospitals do not have facilities for determining blood pH, we believe that the history of prostatism in an elderly patient, plus the laboratory finding of a decreased CO_2-combining capacity, is sufficient basis for diagnosis of metabolic acidosis.

Hypocalcemia, which may be present in the untreated patient with chronic urinary retention, is usually not apparent clinically. It is only when acidosis is treated vigorously with lactate or bicarbonate that calcium deficiency may appear. Symptoms of calcium deficit may be numbness of ears, lips, and finger tips, and muscle cramping. Clinical signs are hyperactive reflexes, positive Chvostek and Trousseau signs, and tetany with carpopedal spasm. A further aid in diagnosis of calcium deficit is the laboratory finding of a serum calcium level below 5 mEq./L. or 10 mg. per cent.

Although mild to moderate hyperpotassemia is frequently present in the patient with urinary retention, it is usually not apparent clinically. Hypokalemia, however, does become apparent in many instances during the period of fluid therapy and bladder drainage when glomerular filtration improves. The significant clinical signs are muscular weakness and paralytic ileus. The electrocardiograph may reveal decreased amplitude of T waves, depressed ST segment, and prolongation of QT interval.

Abnormalities in osmolar concentration and volume of extracellular fluid may be considered together for purposes of diagnosis. As stated previously there are 3 types of dehydration: loss of extracellular fluid without much electrolyte or "hyperosmolar dehydration," loss of extracellular fluid with osmolar concentration of electrolyte, and loss of extracellular fluid with relatively large amounts of electrolyte or "hyposmolar dehydration." Clinical signs of hyposmolar and osmolar dehydration are essentially the same: anorexia, apathy, absence of thirst, ileus, hypotension, tachycardia with faint pulse, shrinking and wrinkling of tongue, stickiness of the skin, and body temperature below 98.6°F.

Again, since many hospital laboratories do not have flame photometers for sodium analysis, the physician will have to depend primarily on serum chloride determination for estimation of osmolar concentration of electrolytes. If the serum chloride is about 100 mEq./L., then the osmolar concentration of electrolytes in the extracellular fluid is probably normal. If the serum chloride level is less than 95 mEq./L., then there is a decreased concentration of electrolytes in the extracellular fluid. Plasma chloride estimation is a gross and often inaccurate index of osmolar concentration. If a flame photometer is available, then a sodium determination will be the most accurate method. A serum sodium level below 120 mEq./L. indicates decreased osmolar concentration while a level above 140 mEq./L. denotes increased osmolar concentration.

The patient who has "hyperosmolar dehydration" will demonstrate many of the same clinical signs exhibited by the other types of dehydration. Stickiness of the skin, ileus, hypotension, and tachycardia may be present. The

patient with hyperosmolar dehydration differs in that his temperature is usually above 98.6°F., his tongue is red and swollen, his skin in flushed, and he is usually restless rather than apathetic. Serum analysis may reveal chloride levels above 105 mEq./L. or sodium levels above 140 mEq./L.

THERAPY

Relief of back-pressure

Since back-pressure due to urinary retention is the primary cause of renal impairment in prostatism, retention must be given prompt relief. Bladder drainage not only halts further renal deterioration but results in improvement in kidney function and structure.[8, 9] Urethral catheter drainage is quite adequate for the patient with mild acidosis and in good general physical condition. Suprapubic cystostomy, however, is the appropriate type of drainage for the anemic, debilitated, stuporous, markedly acidotic type of patient who requires prolonged catheter drainage before definitive surgery can be contemplated. Urethritis, epididymitis, and acute pyelonephritis occur less often with suprapubic drainage than with urethral catheter drainage. An acute pyelonephritis superimposed on an already impaired kidney is often enough to cause a patient's death.

Correction of fluid and electrolyte abnormalities

In addition to establishment of urinary drainage, the chemical anatomy of the body must be restored to as near a normal state as possible. The order of therapy involves first, correction of osmolar concentration and ionic compositional aberrations; second, restoration of extracellular fluid volume; and third, provision of water for loss through skin, lungs, and kidneys. For most cases only 2 repair solutions need be considered: 5 or 10 per cent glucose in water solution and a mixture containing 1 part 1/6 molar sodium lactate and 3 parts isotonic sodium chloride solutions. Each liter of chloride-lactate mixture supplies 157 mEq. of sodium, 115 mEq. of chloride and 42 mEq. of bicarbonate. The chloride-lactate mixture serves to correct osmolar and hyposmolar dehydration as well as metabolic acidosis. The glucose-water solution is used to correct hyperosmolar dehydration, spare protein catabolism, prevent starvation ketosis, and provide water for insensible loss and diuresis.

One-sixth molar sodium lactate solution, which furnishes the body with 167 mEq. of sodium and bicarbonate per liter of fluid, should be employed only to alleviate uncompensated metabolic acidosis; it is rarely necessary to use more than one liter in any particular patient. As soon as the hyperpnea disappears, the isotonic sodium lactate is discontinued and the chloride-lactate mixture instituted. The chloride-lactate mixture is preferred for most cases of compensated metabolic acidosis since it corrects simultaneously both acidosis and extracellular fluid volume deficits. In addition, danger of inducing hypocalcemic tetany is less with the chloride-lactate mixture than with the isotonic sodium lactate solution. If tetany is precipitated during correction of acidosis, 10 per cent calcium gluconate is administered intravenously until the tetany disappears.

Solutions containing potassium salts *are not used in the initial phases of*

therapy because of danger of hyperkalemia during the period of impaired glomerular filtration. If, after several days of bladder drainage and fluid administration, glomerular filtration improves, as evidenced by a falling blood nonprotein nitrogen level, then potassium should be added to the glucose solution to prevent and correct hypopotassemia. Four grams of potassium chloride (52 mEq. K) per day are usually enough to accomplish this purpose. The potassium is given in a dose of 2 grams of potassium chloride per liter of 5 or 10 per cent glucose in water solution.

There are no formulas in determining the exact amount of fluids needed for a particular patient. One must be guided by the patient's clinical response and available laboratory data. Insufficient fluids will produce minimal improvement in the patient's symptoms and signs and little change in the blood chemistry studies. Excessive fluids will produce edema of either the extracellular or intracellular type, depending upon the solutions used.

Occasionally a patient must be given relatively enormous amounts of fluid because of marked diuresis. This situation is encountered in some patients during the initial phase of bladder decompression.[12] The diuresis is very similar to that seen during the recovery phase of acute renal failure. The patient may have a urinary output of 10 liters in 24 hours; the urine may or may not contain large amounts of salt. Therapy should include volume for volume replacement of the salt and water losses in the urine plus provision of 800 to 1200 cc. water per 24 hours for insensible loss. The replacement fluid should be 5 per cent glucose in water if salt loss is negligible. If urinary salt concentration is high, the chloride-lactate mixture is appropriate. If salt loss is moderate, both chloride-lactate mixture and 5 per cent glucose in water are given in suitable amounts.

It should be emphasized that use of an incorrect solution may result in the death of a patient. For example, 5 per cent glucose in water solution is considered by many to be entirely harmless when given intravenously irrespective of the patient's fluid and electrolyte status. Nothing could be further from the truth! Coma, oliguria, and death can be produced readily by administering 5 per cent glucose in water to a dehydrated patient with decreased electrolyte concentration in the extracellular fluid. When glucose in water is given to such an individual, the water shifts from the extracellular space into the body cells producing intracellular edema manifested by salivation, lacrimation, diarrhea, hyperreflexia, coma and oliguria—the syndrome of water intoxication.

For moderate dehydration with increased osmolar concentration and mild acidosis, glucose in water solution is indicated. This solution plus bladder drainage will correct the dehydration as well as the acidosis.

If the patient exhibits marked dehydration with normal or decreased osmolar concentration and acidosis, chloride-lactate mixture is indicated as the first solution to be administered until dehydration, osmolar concentration, and acidosis are alleviated. Then glucose in water solution is given to provide water for insensible loss and urinary diuresis. Electrolyte solutions should not be used as a primary source for urinary water and insensible loss.

Prostatectomy can be carried out after fluid and electrolyte abnormalities have been corrected. In mild cases homeostasis will be accomplished within a few days after hospital admission. Patients with more extensive renal dysfunction will require prolonged suprapubic cystostomy drainage before fluid and electrolyte balance is stabilized. Patients can be sent home on tube drainage after being weaned from parenteral fluids. After being started on oral feedings, they must be watched carefully for signs of renal tubular insufficiency which may manifest itself in polyuria, persistent hypochloremia, hyperchloremic acidosis, or hypochloremic acidosis. If the patient has a salt-losing nephritis without acidosis, he should have a daily intake of 2 to 4 grams of salt in addition to the usual salt in the diet. If the patient exhibits evidence of lower nephron damage in the form of hyperchloremic acidosis, then sodium bicarbonate, 3 to 4 grams per day, should be prescribed. Both salt and bicarbonate are indicated if the patient tends to slip into hypochloremic acidosis.

Hypocalcemia and hyperphosphatemia can be treated by the oral ingestion of calcium lactate, vitamin D, Amphojel and Shohl's solution. The Amphojel serves to prevent absorption of phosphorus from the intestine, thus tending to reduce serum phosphorus. Shohl's solution is used to aid in absorption of calcium lactate from the gut and to provide available base to the body.[13]

SUMMARY

The present morbidity and mortality observed in the treatment of prostatism stems principally from the small group of patients who have marked fluid and electrolyte disturbances. Rational therapy must be based in part on a knowledge of the etiology of the fluid disorders. The mechanism by which urinary retention produces impaired renal function with resultant fluid disturbances is indicated. The various types of electrolyte disorders as well as their clinical and laboratory manifestations are discussed. The necessary therapeutic measures employed in restoring homeostasis and the reasons for their use are presented.

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An Intensive Treatment Program for State Hospital Geriatric Patients

Allan Rechtschaffen, M.A., *Stuart Atkinson,* M.A., *and John G. Freeman,* M.D.

OVERCROWDED state hospitals are limping under an ever increasing rate of geriatric admissions. Malzberg[1] found that the rate of first admissions for senile psychoses to all hospitals in New York State increased from 8 per 100,000 in 1930 to 12 in 1940, while the rate for psychoses with cerebral arteriosclerosis increased from 11 per 100,000 in 1930 to 21 in 1940. Approximately 38 per cent of patients admitted to Fergus Falls State Hospital, Fergus Falls, Minnesota, are over 60 years of age.

Four factors have been emphasized to explain the increase in geriatric admissions:

1. The proportion of old people in the United States has been increasing steadily.
2. The elderly are more prone to emotional disorders and deteriorative processes. For example, the 1950 census showed that of the population 15 years and older of the area serviced by the Fergus Falls State Hospital, approximately 19 per cent were over 60, while 38 per cent of new hospital admissions are over 60.[2]
3. There is a prevailing negative attitude toward the elderly, which was described by Ginzberg[3] as "an approach based upon both a feeling and a conviction that the elderly are lost causes, that those advanced in age are doomed to regression and degeneration leading to such a loss of vitality that they are placed outside of any working active social group, whether family, clan, tribe or society." Commitment of the aged person to a state hospital often represents the epitome of such a negative attitude.[4]
4. The heightened tempo of modern living, smaller families and smaller dwelling units, increased mechanical hazards, and the movement of population to urban centers make home care of the aged increasingly difficult.

Various workers, of course, have made successful assaults on the medical front, such as Clow[5] whose treatment of 100 patients suffering from psychosis with cerebral arteriosclerosis resulted in the recovery of 11 of the patients and the return home of 49. Thewlis and Gale[6] have stressed ambulatory and preventive geriatrics. Several researchers have investigated personality characteristics of the aged and have outlined appropriate psychological procedures. Group workers and case workers have established progressive community and counseling programs. Others have proposed new types of living arrangements more attractive and sociologically sound for the mildly incapacitated than state hospitals.[4, 6] Most important has been the movement for public awareness of the problem.

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The work in geriatrics, especially during the past ten years, has been embryonic but energetic. The application of newly developed principles and procedures to state hospital situations has, unfortunately, been considerably less energetic. The public psychiatric institution has been properly regarded by professional personnel as the last resort, and placement to be avoided if at all possible. This attitude will continue until such time as each state hospital is equipped to render an adequate treatment program for geriatric patients.

The Fergus Falls Intensive Treatment geriatric program is an attempt to show that with energetic optimism and active attention and treatment, the discharge rate of geriatric patients can be increased. Because the institution was faced with serious geriatric overcrowding at the time the project was conceived, the decision was made to start with good prognosis patients and aim at discharge rather than start with more regressed patients and aim at improvement or better hospital adjustment.

There is sparse literature on comparable projects. Among the more recent reports is that of Smith, Bryant, and Twitchell-Allen[7] on a four-week program of intensive resocializing activities for 43 elderly psychotic women. More comparable in scope to the present program was a geriatric pilot study conducted at Modesto State Hospital, a 19-month activation program for 205 patients over 55.[8] Although the functioning of the Modesto program was plagued with shortages of personnel and facilities, extensive personnel changes, and various administrative difficulties, it resulted in 5 patients being discharged and 51 patients receiving ground parole. All of the authors of the present article had gained planning experience through supervision at various times of our Total Push program for regressed schizophrenics.[9, 10]

SELECTION OF PATIENTS

For purposes of this study, it was desired that patients come from a geriatric group with good prognosis for discharge and so situated within the institution that a unified treatment program could be planned. The new geriatric section of the hospital fulfilled these requirements. This section consists of two buildings, GM (Geriatrics Men) and GW (Geriatrics Women), both of modern design and constructed especially for aged patients. Each building has three wings housing 57, 55, and 44 patients each and a total bed capacity of 156. In general, patients at GM and GW have the highest behavioral level of the aged in the hospital. There are approximately 750 patients over 60 in this 1900-bed hospital.

One hundred ten patients were selected from a total of 312 by means of two prognostic criteria: the behavioral level of the patient and the amount of interest in the patient shown by relatives. Charge nurses rated each of the 156 patients in her building 1, 2, or 3, with 1 representing low and 3 representing high behavioral level. The number and recency of letters and visits from relatives were tabulated, and from this tabulation, patients were assigned ratings of 1, 2, or 3, with 1 representing low interest on the part of the relatives and 3 representing high interest. Behavior ratings and the interest

of relatives ratings were added, yielding a prognostic score of from 2 to 6 for each patient. The 55 patients with the highest scores in each building were selected for the program, and later shifted so that each group was located in the 55-bed wing of its respective building.

At the end of the six-month experimental period, 171 patients had spent or were spending some time on the program, new patients having been placed on the program whenever a vacancy resulted from discharge, death, or transfer. The census of each unit was usually maintained at 50 to 55 patients.

The average age of the 171 patients who had been on or were on the program was 72 years. The average length of hospitalization was ten years. Diagnoses of the patients were as follows: 46, senile psychosis; 4, non-psychotic senile; 33, psychosis with cerebral arteriosclerosis; 41, schizophrenia; 18, manic-depressive psychosis; 6, involutional psychosis; and 23, other diagnoses.

PERSONNEL

NURSING and custodial personnel on the geriatric section were not increased during the program. The ratio of nursing personnel to patients varied from about 1 to 20 for daytime shifts to about 1 to 75 for evening shifts. This figure obviously falls far short of the recommendations of the Committee on Hospitals of the Group for the Advancement of Psychiatry,[11] which suggests 7 nurses and 10 attendants on the morning shift and 2 nurses and 6 attendants on the night shift for a 100-bed geriatric building.

Two psychologists, working under the supervision of the clinical director, a psychiatrist, were placed in charge of the program, one for the men's unit and one for the women's. Each psychologist spent about half of his forty-hour week on the program. Other personnel included two social workers working about one-third of their time on the program, and an occupational therapist and a recreational therapist, both working full time. The regular ward physician cared for medical needs and supervised all somatic therapies.

DESCRIPTION OF THE PROGRAM

1. The team approach

The entire program was characterized by a team approach, the team consisting of psychologist, social worker, ward physician, recreation worker, occupational therapist, charge nurse, and psychiatric aides. In each phase of the program there was a great amount of interaction and communication between the different personnel. At weekly meetings, individual patients were discussed, organizational problems reviewed, and staff education in geriatrics put into effect. Staff morale was generally quite high, despite the fact that the more successful the program the harder the job, since discharge of high level patients was usually followed by replacement with more confused and deteriorated patients.

2. Review of patients

All professional workers who have had prolonged contact with public psychiatric hospitals are aware of the infrequent review that is made of the

majority of the patients—newly admitted patients being, of course, subject to more frequent and intensive observation. Geriatric patients are among those whose cases are given the least amount of attention after the first few weeks of hospitalization. It is common practice in many hospitals to have little more than yearly progress notes on eating, sleeping, and working habits on the greater proportion of patients. As a result of such sparse review, an unknown number of patients make a full or partial recovery after some years of hospitalization which goes unnoticed.

To avoid such infrequent review and lack of adequate rehabilitation at the proper time, the following procedures were instituted on the geriatric program. As early as possible each patient was interviewed and the case history was reviewed by psychologist, social worker, and charge nurse. A treatment plan, which often called for specific types of activation, nursing care, social planning, and psychological approach, was authorized for each patient. Each team member was expected to carry out his portion of the plan and give periodic reports to the psychologist and to the team conferences. The clinical director was consulted on the over-all plan and special types of decisions. Summaries of histories and treatment plans were left on the ward for review by all team members. Space was provided for periodic notations as to progress.

3. Activation

An occupational therapy class was held five days a week on each treatment wing, in which patients were encouraged to develop new hobbies or renew interest in old ones. About half of the patients on each unit participated actively. Most of the women continued their activities after the occupational therapist had left the unit. A small woodworking shop was set up on the men's unit so that the men could also continue work. One man who had suffered from feelings of worthlessness and who had tried to commit suicide gained a great deal of self-respect from making and selling toy rocking chairs.

During recreation periods, both men and women participated in community singing, mixed parties and dances, card playing, puzzle games, picnics, simple ball games, and taking walks to nearby points of interest.

After the first few months of the program the atmosphere of the treatment units appeared to change considerably; it was usual to find about half the patients engaged in some activity in contrast to the former long row of inactive patients sitting in chairs along the walls.

4. Group therapy

Group therapy was carried out in both units one hour twice a week. Therapy was on a voluntary basis and usually not more than half of the patients were present. Psychologists, social workers, and recreational therapists shared the leadership of the sessions, which ranged from insight-provoking talks on problems of growing old and of being in a state hospital, to general discussions of politics and hunting and fishing. It was observed that women were more verbal and responded better to the insight-gaining sessions, while the men preferred the general discussions. This agreed with the findings of David-

son and Kruglov[12] which indicated that in institutions aged women were more responsive to their environment than aged men.

5. Work therapy

Constant attempts were made to get patients interested in constructive work ranging from full-time employment in hospital industry to routine chores taking only an hour a day. In getting patients to accept responsibility for these chores—sweeping a room, making 3 or 4 beds, helping more feeble patients, brushing off clothes, acting as a doorman or watering lawns—the major consideration was the amount of self-respect, self-esteem, and optimism which could be inspired in the patient. At times, half the patients were engaged in some form of active work.

6. Other therapies

Because of the time consumed in such treatment, psychotherapeutic interviews were limited to those patients who seemed best able to profit by relatively few sessions. Supportive therapy was stressed. Nurses and psychiatric aides were taught to approach the patient with understanding and friendliness, with the result that many therapeutic relationships were developed. For example, a male patient had overcome his acute symptoms but was unwilling to leave the hospital because of feelings of inferiority and unworthiness. The ward nurse gave continued support and reassurance, the patient's confidence increased so that he was ready for discharge. At last report, he was quite happy in his new environment.

Electroshock treatment was used in only 5 cases in which a strong depressive element was present. This treatment was always accompanied by socialization and psychotherapeutic procedures.

Systematic attempts were made to alleviate confusion and increase orientation of the patients. The hospital newspaper was read and discussed at group meetings. When a new patient entered the ward, he was introduced to the physical plant and to other patients. Calendars with big, bold print were placed liberally throughout the ward, and it was surprising how many patients knew the date when they were interviewed.

7. Social planning

Social planning was initiated as the patient started on the program. Form letters were sent to relatives telling of the attention being given the patient and asking for information concerning the patient's previous hobbies, interests, and habits. When a patient was ready for discharge, relatives were asked what plans they could make for the patient. When they could not plan for the patient, an attempt was made to place the patient in a private boarding or rest home. Whenever possible, this home was advised as to suitable treatment for the patient after discharge.

In an effort to place patients who were ready for discharge, hundreds of letters were written by the social workers to relatives, boarding homes, rest homes, and county welfare boards. Often it was necessary to have several

interviews with relatives to convince them that the patient had improved and was ready to leave, and to help them to plan for the patient.

RESULTS OF THE PROGRAM

RESULTS of the program were far beyond original expectations. During the first six-month experimental period, 46 patients left the section. During identical periods of the two previous years the average discharge* rate from the section had been 10.5. Therefore, the program resulted in a 338 per cent increase in the discharge rate. Statistics showed that chances were 1 in 1,000 that an increase of that magnitude could have resulted purely on a chance basis.

Five of the 46 discharged patients were returned within the six-month period. In the identical periods of the two previous years 3 of 21 discharged patients were returned. Thus, the return rate of the experimental group was no greater than the return rate for previous years.

Of the 46 patients who were discharged, 22 went to live with relatives; 9, to live in private rooming homes; and 15, to live in rest homes. None was so feeble or deteriorated as to need special nursing care. None was discharged who did not want to leave the hospital.

Increase in discharge rate was the only quantitative evaluation made of the program. Qualitative improvements in mental attitudes, alertness, orientation, activity level, and social interest were obvious on the unit.

The average age of discharged patients was 71 years. These patients had been in the hospital an average of six years. The diagnoses of the 46 discharged patients were: 14, senile psychosis; 1, nonpsychotic, senile; 8, psychosis with cerebral arteriosclerosis; 3, schizophrenia; 8, manic-depressive psychosis; 2, involutional psychosis; and 10, other diagnoses.

One hundred seventy-one patients had contact with the program. Of these 46 were discharged; 32 left as a result of death, transfer to other wards for medical reasons, or transfer to non-intensive treatment units because initial review indicated poor prospect for discharge; 93 are still on the program.

DISCUSSION

THE Intensive Treatment geriatric program at Fergus Falls State Hospital attained its initial objective of raising discharge rate of aged patients. No essentially new procedures were used, nor were there new theoretical orientations; everything that was tried was consistent with suggestions for psychologically sound treatment of aged that have been made by many workers in the field of geriatrics. The basis of the program was the organization of these psychologically sound practices into a consistent, integrated, fairly comprehensive, and optimistic approach to the aged in a state hospital.

Undoubtedly, the increase in discharge rate resulting from the program seems large. With continuance of the program the discharge rate is expected to become stabilized at an unknown level somewhere between pretreatment

*All references to "discharges" actually mean "provisional discharges." Patients leaving the hospital are usually considered provisionally discharged for one year, at the end of which, barring relapses, they receive a final discharge.

rate and the rate during the first six months. The large discharge rate during the first six months of the program was due in part to the reservoir of good-prognosis patients who had not previously received sufficient attention. In several cases little had to be done beside making adequate plans for living arrangements outside the hospital. As a result of the numerous early discharges, the reservoir diminished.

As it diminished, certain therapeutic aspects of the program showed evidence of improvement and expansion. Staff morale and optimism regarding treatment of the aged increased greatly and proficiency in dealing with elderly patients improved. After the first several discharges from the unit, many of the remaining patients apparently gained new hope and optimism, and requests for discharge increased. Unknown to the staff, one male patient went so far as to answer a newspaper advertisement for employment, received a favorable reply, and was granted a provisional discharge for a trial at his new job.

CONCLUSIONS

These initial results are encouraging. They indicate that state hospitals, with their limitations, may have a greater potential for the treatment of their aged patients than has been generally realized. Of interest to hospital administrators, legislators, and the public is the possible conclusion that a program of active treatment for the institutionalized aged may be more economical and more satisfying in terms of human values than simple custodial care which has more generally been provided.

However, this is a preliminary report and several important questions remain to be answered. Will such a program show favorable results with more deteriorated geriatric patients? What is the actual amount of behavioral improvement resulting from such a program? What areas of abnormal functioning are helped by the program and what areas show no change? How permanent are the gains made with various types of patients? What are suitable types of social planning and follow-up care? What is the effect of greater use of somatic therapies? As the program continues beyond the initial six-month period reported here, attempts will be made to answer these questions.

We are indebted to the following persons for their help in organizing this program: W. L. Patterson, superintendent; R. J. Lucero, director of research; M. Swanson and W. Pappas, social workers; A. Mahowald, M.D.; E. Brown and M. Ladwig, recreation and occupational therapists; N. Helander, M. Jackson, and M. Lucero, graduate nurses; and A. Foss, research clerk.

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EDITORIAL

Study of Blood Pressure in Persons Over 65

AN ARBITRARY fixed figure has been used in the past as the upper limit of normal blood pressure. For persons over 40 it has usually been 150/90. Yet, in a recent study of the blood pressure in 74,000 gainfully employed persons up through 64, it was shown that the blood pressure normally rose with age and differed by sex. The upper limit of normal, according to calculated frequency distribution curves, was found to be higher for each age group than previously believed.

The question arises whether these findings hold true for people 65 years of age and older. An accurate evaluation of blood pressure in old age has assumed great importance because the increased life span has produced growing millions of people over 65.

The New York Heart Association is currently sponsoring a study of the blood pressure in persons 65 years and over to discover whether the criteria of hypertension need to be changed, as in people under 65. Specifically the questions posed for investigation are (1) what is the normal range of blood pressure, as well as the lower limit of hypertension, for each age group over 65 for both sexes, (2) does the blood pressure continue to increase with age and vary with sex after 65, (3) is blood pressure related to weight, or (4) to surface area, or (5) to height, in people over 65.

Reinvestigation of the relation of hypertension to coronary disease and thrombosis, cardiac enlargement, aortic abnormalities, hypercholesteremia, and diabetes is necessary in people over 65. This was recently done in people under 65, using the newly established limits of normal blood pressure. It was found that an etiologic relationship between hypertension and coronary occlusion exists only in women; there is no such significant association in men. Furthermore, although in women there was a definite correlation between hypertension and enlargement of the heart, cardiac enlargement was found to occur in men with coronary occlusion and normal blood pressure.

Such findings make it imperative that analogous research be extended to the older age groups—that is, to those 65 and older—to discover whether such trends continue to be factors in the aging process. The first step is to know what levels of blood pressure truly represent hypertension.

With this in mind, my associates and I, under the sponsorship of the New York Heart Association, have undertaken a Blood Pressure Study of persons 65 years of age and over. When industrial concerns and homes for the aged were found not to have adequate blood pressure data available, the aid of the medical profession was enlisted. Fourteen thousand practicing physicians throughout the country have been directly contacted by individual letter and asked to fill in from 1 to 6 questionnaires on newly-examined persons: 2 each in the age groups 65 to 69 and 70 to 74, and 2 above 75 years of

age. The subjects were to be in fairly good health and not bed-ridden, although they might have some chronic illness. Those able to do part or full-time work were particularly desired. The most suitable subjects, therefore, would be patients coming for routine examination and relatives or friends of the physician in the desired age group.

For statistical and interpretative analysis it is essential that there be a high percentage of response from the doctors. The questionnaire is simple and brief and the directions clear: most of the questions require merely a check mark. This data can then be easily transferred to "punch" cards for subsequent IBM tabulation.

Since blood pressure is often said to vary according to geographic location, it is desired to obtain data on persons geographically located in accordance with the proportional distribution of those who are 65 and over. This will give a sample representative of the population at large, yet permit analysis of the data to ascertain a correlation of blood pressure level with climatic and area differentials.

Moreover, in the earlier studies of the 16 to 64 age groups, absolute and relative variations in blood pressures became more marked with an increase in weight, particularly after 40 years of age. It will be of especial interest to pursue the study of the relationship of blood pressure to weight in even older people—those over 64 years of age.

It is hoped that the members of the medical profession will realize the importance of cooperating in this study and will be interested enough to fill out the questionnaires.

Those who have already received questionnaires are urged to complete them as soon as possible and an additional supply can be obtained by dropping a card to "Blood Pressure Study," 11 East 100 Street, New York 29, New York. All other physicians who are interested in participating in the project are also urged to send a card to this address.

The results will be published upon completion of this study.

ARTHUR M. MASTER, M.D.

THIRD INTERNATIONAL GERONTOLOGICAL CONGRESS

THE Third International Gerontological Congress will be held in London, England, July 19 through 23, 1954, under the presidency of Dr. J. H. Sheldon.

The main meetings of the Congress will take place in Church House, Westminster, July 19-23. The scientific meetings will be July 20, 21, and 22. Visits to places in London, including geriatric units in hospitals, special housing clubs, and other facilities for old people, will be arranged on July 23. Visits to geriatric units and places of interest outside of London will follow these conference dates.

Chairman of the American Committee of Cooperation is Dr. W. B. Kountz, St. Louis Infirmary, 5600 Arsenal Street, St. Louis, Missouri. Further details of the program will be found in subsequent issues of *Geriatrics*.

GERIATRICS ABROAD

Much of the great progress in geriatrics in the past few years has come from our colleagues in other countries. To keep abreast of such developments, and to enlarge our own horizons, we welcome to this new department of our journal news of geriatric medicine and geriatrics activities abroad.

Geriatrics Care in Denmark and Britain

V. L. Ellicott, M.D., DR.P.H.

OPPORTUNITY came recently, under a World Health Organization fellowship, to see what was being done for the aged in Denmark and England. The experiences of these two socially conscious countries should be of much help to those interested in geriatric care.

DENMARK

THE Danes regard the geriatric patient as a part of a larger social problem of the general needs of old people, both sick and well. For two generations they have been striving to meet the personal and economic needs of their aged citizens. Through old age pensions and housing programs, they have done more than any other country in removing fear of poverty and want from those who are too old or feeble to continue working at a gainful occupation.

Doctors do social work. All workers seem to feel an obligation to help the patient in whatever respect he needs it, and this is especially true of doctors. In my first visit to a Danish hospital, I saw a woman of 72 pleased at the prospect of an early discharge. The medical director, in describing her, was as familiar with her plans for living as with her medical status. She was a widow and was planning to occupy a two-room apartment and do all her own work. Her pension would not be enough to pay for rent, food, and clothing, but she had a small income from money left her by her husband, and this was sufficient to make up the difference. In the absence of this inheritance and unable to earn any money, the hospital would have aided her in applying for some form of public assistance.

General practitioners, as well as the doctors who practice in hospitals, take a similar interest in the patient's social problems. Social workers are used to some extent, but the physicians themselves perform much social work including mailing of forms to pension offices. This use of the doctor is of long standing.

Attractive surroundings. The Danes feel that the old person who must spend the rest of his life in an institution — a chronic hospital, nursing home, or care home — is entitled to attractive surroundings. The old person is given a room to himself and allowed to have some of his furniture and other per-

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sonal belongings. They feel that a small administrative unit can be made more attractive and that it should be near the patient's home. Kitchenettes are often provided in care homes so that the host can prepare tea for the visiting guest.

A distinction exists in some places between facilities for insured persons and those for the uninsured. This is one of the means of urging the people to join and remain under the insurance plans. In Copenhagen, De Gamles By (Old People's Town), most attractive in appearance and individual comfort, is available only to the insured group. Nörre Hospital, gloomy and bleak, with patients in large wards having little more than a chair and a stand at each bed, takes care of the noninsured group. The visitor is shown Nörre Hospital with an explanation that it is due for a change.

Purchasing power of the aged. Almost all wage earners in Denmark contribute substantially to the national pension fund. When old and unemployable they receive pensions, which, though small in terms of equivalent United States currency ($25.00 per month for a single person), are high in proportion to the cost of living. Although this plan is socialistic in that the government participates on a large scale, it is an indirect help to individual enterprise. The old people, having money to pay their own way, help private business, and at the same time maintain self respect. Denmark is known the world over for its apartment houses for the aged. These have been financially successful because the old people have had, through their pensions, enough money for rent as well as food and clothing.

At Fru Wessman's, a private nursing home in Copenhagen, the operator, Mrs. Hansen, received $40 per month from the old couples and about $20 from single persons. Out of this income from pensions, she gives good food, adequate, though somewhat small rooms, and nursing care as needed. She makes her living out of this business of nursing home operation.

Costs held down. Denmark is not a rich country, and has been able to carry out its social services only by strict economy. Hospital costs are about five dollars per patient day. The service of general practitioners (financed through insurance) is cheap. Apartment rents are low. In general the state, local government, and patient share costs. State and local subsidies bring the hospital cost to the patient down to one to one-and-a-half dollars per day.

ENGLAND

PASSING from Denmark to England the visitor is impressed by a number of differences in interest and approach. In England there is greater separation between the jurisdiction of the hospital and that of welfare, greater variation in the patterns of different localities, more interest in old people's clubs, and greater progress in rehabilitation of the bed patient.

The geriatric patient is regarded as one of the most serious hospital problems. England's population has even more old persons than ours (10.8 per cent over 65 in England as compared to 8.5 per cent in the United States), and their government has assumed broad responsibility for hospital care of the old as well as the young. When the National Health Act became effective in July 1948, large numbers of hospital beds filled up with longstay patients, old chronics who kept out urgent acute cases. Hospital authorities have attacked the problem with vigor, and in so doing have made valuable contributions.

The English have set up different types of hospital services and nursing homes and move the patient along as his condition improves. This releases hospital beds for new admissions and reduces cost since each patient, as he improves, is moved progressively to a less expensive accommodation.

The old patient is regarded as a distinct problem. If old and young are mixed, 90 per cent of the group, they say, will be old; so why not call the chronic wards geriatric units and oper-

ate them as such? Most of the young chronic patients can be better treated in separate specialized units according to their medical diagnoses.

The active geriatric unit. The first and most important unit through which the patient is assigned is called the "active geriatric unit." It may be one or two wards of a large general hospital or a separate unit affiliated with a general hospital. The patient remains in this unit only long enough for diagnostic study and the first stage of rehabilitation. The average stay is two or three months. Maximum effort is directed toward getting him out of bed and on his feet.

Patients in the unit have a variety of pathologic diagnoses, but a common factor is need for rehabilitation, particularly ambulation, and re-education in dressing and otherwise taking care of themselves. On admission to a unit, patients are studied and assessed, not only from a medical standpoint, but as to degree of disability and as to personal factors which will influence recovery.

The visitor, passing through a unit, sees patients struggling persistently to bend their stiff joints and move about. One may be getting up and down from a chair facing the foot of his bed, with the bed frame serving as pullup bar; another may be shuffling along the corridor, occasionally steadying himself on a rail, bed, or chair. Attendants give little physical help, but rather encourage and teach the patient to learn by his own efforts. Nurses are used less than attendants. Major emphasis is placed on getting the patient out of bed, which begins with creating his desire to do so.

For the institution, ambulation is justified on economic grounds; for the patient it is good medical practice. The old person's physiology improves when he becomes ambulatory. Getting up is good for appetite, sleep, and strength, and is most important in cure of incontinence, one of the most troublesome complications of the aged infirm. Getting up restores the patient's feeling of usefulness and participation in living, and is the best of all morale builders.

Auxiliary accommodations. The active geriatric unit must treat many patients, but it can do this only if other accommodations stand ready to take each patient as soon as he is ready to move on. Some move directly from the geriatric unit to their own family homes, some to residential homes, and some to nursing homes or chronic hospitals. The patients of the first two groups, as they leave the unit, move out of the hospital's field of responsibility. Under the English system, those of the third group, who are permanently bedfast or otherwise require continuous hospital or nursing care, continue as a hospital responsibility.

The hospital solves the problem of moving the patient on principally by setting up annexes which are under its own control. Because of relatively high cost, private nursing homes are available for only a small proportion of the population and beds are rarely available when wanted. The annex is usually not owned by the hospital (which in England means owned by the government) but by a voluntary group organized for the purpose of cooperating with the hospital. Financial arrangements are interesting and varied but the essential feature is that the hospital pays the organization a predetermined cost for each patient's care. The organization agrees to admit patients only as transfers from the mother hospital, and the hospital furnishes whatever medical service is needed. A resident physician is not considered essential.

The halfway house. The type of annex used for the frail ambulant is termed "halfway house" because the patient is considered to be halfway between hospital and home. It is frequently a large residential estate which has been purchased at low cost. The average contains 35 beds and is well-equipped and attractive both inside and out. Renovation costs may exceed the purchase price. Patients sleep in large rooms containing four to eight beds, eat together in a dining room, sit together

in living rooms, get about by themselves, and in general take care of their own needs. They are encouraged to move about through the halls and along the outside walks. The casual visitor will see only two or three in bed. Buildings usually have no elevators. The operating cost per patient day is one-third to two-thirds that of the geriatric unit, and the average stay is six weeks.

Longstay annex. This unit functions as a nursing home for the permanently bedfast and other patients who need continuous nursing care. If other units functioned adequately, few longstay beds should be needed. As in the halfway house, admissions are limited to patients who have passed through the active geriatric ward, for it is a serious error to classify anyone as permanently bedfast before rehabilitation has been proved impossible.

The longstay annex is the patient's permanent home. Each unit is expected, whenever necessary, to keep a patient until he dies. Aides are selected largely because of their sympathetic interest. Those with a hopeless approach are not employed, nor are those who believe in keeping patients in bed on the grounds of being less troublesome.

Residential accommodations. The flow of patients from geriatric unit to annex is possible only if, in turn, there is assurance of vacancies in the annexes. There must be a steady flow out of the annexes, especially from the halfway houses, on to the patient's home, when this is possible; otherwise, to some residential type of institution. At this stage, the patient is no longer the responsibility of the hospital. The hospital authorities realize, however, that it is to their own interests to cooperate with welfare groups and others who now take the responsibility. A hospital or annex bed may be blocked because the hospital has no moral right to discharge a patient who has no place to go.

A certain amount of financial and administrative bickering occurs whenever a patient passes from the one authority to another; but it is interesting to note that in England the bickering arises when the patient goes from nursing home to residential status. In our country, it is apt to be between hospital and nursing homes.

The patient's home. The flow of patients begins and ends with the patient's own home and his own doctor. The successful directors of geriatric units place great emphasis on these home factors. They believe that the patient who is still at home but who is likely to need future hospital care should be studied carefully and a plan made to prevent, as far as possible, his becoming incapacitated. If hospitalization becomes essential later, he should be admitted before his condition has deteriorated to the point where rehabilitation is difficult.

Cooperation of agencies. The patient, moving from one service to another, is likely to feel insecure. Change is disturbing to any patient, but to the charity patient, or someone using up his savings, it seems disastrous.

After forming a personal attachment to the staff of one unit, the patient fears that he may not be wanted in the next. By introducing him gradually to the physician who will care for him after he leaves, the patient is made to feel that there is a responsible system behind each service and that he will not be forgotten along the line.

The patient, as he passes through the various stages, will need the services of many different groups. If the geriatric hospital operates on a state level, the patient at some stage will pass from the jurisdiction of state to local authorities. Local groups must have a smooth referral system for the admission and discharge of the patient. On the local level many groups are involved—the health and welfare departments, the practicing physicians, and voluntary organizations. Representatives of these groups should form the habit of sitting around the conference table to work out efficient procedures. Although each may be responsible for only one or two services, all of them, when meeting together, should feel a group responsibility for every need confronting the patient.

From the desk of
R. A. SUTTER, M. D.

GREAT for Older Patients!

INSTANT RALSTON
Extra-Nutritious!
Whole Wheat with
5% extra wheat germ

Cooks in 10 Seconds!

GERIATRICS *Book Reviews*

Diseases of the Liver, Gallbladder and Bile Ducts

S. S. Lichtman, 3rd Edition, 1953. Philadelphia: Lea and Febiger. 1315 pages. $22.00.

The third edition of this comprehensive book is now so extensive that it is published in two volumes. The general arrangement of the previous editions remains unchanged; it has been brought up to date by the inclusion of additional references to virtually all of the recent publications in this field.

The text is not limited solely to a discussion of hepatic and biliary tract disease. An initial chapter dealing with the structure of the liver is adequately illustrated with material taken from recent publications in that field. An extensive chapter on liver function tests and their interpretations is presented. The general symptoms and signs of liver disease are discussed at length followed by chapters devoted to detailed discussions of individual disorders. As a result, there is much repetition and the text is unnecessarily long. The section devoted to disease of the gallbladder and biliary passages comprises approximately one tenth of the length of the book. The index to the present edition is somewhat more comprehensive than was the case formerly.

A number of criticisms can be directed against the organization of the material. The 210-page chapter on cirrhosis contains reference lists at five separate cites. Since these do not appear at the end of clearly delineated sections, the reader is handicapped in his search for the intended bibliographic citation. The practicing physician or surgeon, eager for a concise, critical analysis of controversial subjects, will find this book disappointing. All available data is presented in an exhaustive fashion, a commendable accomplishment for a reference book but not an appealing aspect to the busy practitioner. The book can be highly recommended to students of hepatic disease as an excellent source for references. It does deserve a place in all hospital, laboratory and medical libraries.

F. W. Hoffbauer, M.D.
Minneapolis, Minnesota

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Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Blood Vessels

The Criteria Committee, New York Heart Association. 359 pages. $2.00.

This is the fifth edition of the invaluable summarization of diagnostic criteria in cardiac and vascular disease. It should be available for ready reference by every physician concerned with the care of cardiovascular problems, which, obviously, includes all those caring for the elderly. The revision is extensive: the roentgenological section has been expanded and a wholly new section on peripheral disease has been added by a subcommittee under the direction of Dr. Irving Wright. The criteria for arterial hypertension remain unaltered: the maximum normal is still considered to be 140/90.

As in the past editions, one of the most valuable services of this volume is the emphasis and clear explanation of the necessity of considering cardiac diagnosis from several viewpoints, such as etiological, anatomical, physiological, functional capacity and therapy. A diagnosis is not just the application of a label. It should consider why, what, how severe and how progressive. This concept is fundamental.

Edward J. Stieglitz, M.D.
Washington, D.C.

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A Social Program for Older People

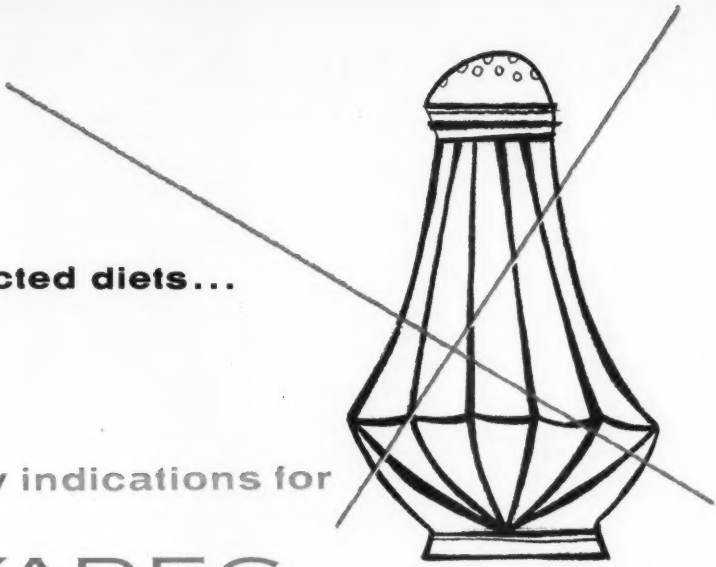
Jerome Kaplan, 1953. Minneapolis: University of Minnesota Press. 158 pages. $3.00.

One of the communities in which there has been phenomenal development in recreation and group programs for the aged is Minneapolis. The pioneering agency has been the Hennepin County Welfare Department, aided by numerous churches, settlements, homes for the aged, and professional workers from voluntary and public agencies. Sparkplug of the movement has been Jerome Kaplan, group worker for the Board.

In this book, Mr. Kaplan lucidly sets forth the philosophy and mechanics for organizing clubs, camping, and institutional recreational programs for those among the aged who require close supervision and assistance in planning and conducting their activities. Out of his own intimate experience with the Minneapolis development, Mr. Kaplan is able to spell out in useful detail the role of the group worker and the volunteer, methods of organizing and conducting club programs, the potentialities of homes for the aged for making life meaningful to the residents, and the operation of camping programs.

Because of its practicality, the book is a valuable guide for professional and lay people working in this field. It has a very good bibliography and an index.

Clark Tibbitts
Washington, D.C.



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MYADEC furnishes, in a single capsule, therapeutic potencies of nine important vitamins and eleven essential minerals and trace elements for normal metabolic function.

MYADEC Capsules are supplied in bottles of 100 and 1000.

each MYADEC Capsule contains:

vitamins:		minerals:	
Vitamin B_{12} Crystalline	5 mcg.	Iodine	0.15 mg.
Vitamin B_2 (Riboflavin)	10 mg.	Manganese	1.0 mg.
Vitamin B_6 (Pyridoxine Hydrochloride)	2 mg.	Cobalt	0.1 mg.
Vitamin B_1 Mononitrate	10 mg.	Potassium	5.0 mg.
Nicotinamide	100 mg.	Molybdenum	0.2 mg.
Vitamin C (Ascorbic Acid)	150 mg.	Iron	15.0 mg.
Vitamin A	25,000 units	Copper	1.0 mg.
Vitamin D	1,000 units	Zinc	1.5 mg.
Vitamin E	5 I.U.	Magnesium	6.0 mg.
		Calcium	105.0 mg.
		Phosphorus	80.0 mg.

*Council on Foods and Nutrition: Nutritional Implications of Sodium Restriction, *J.A.M.A.* 149:1317, 1952.

MEDICAMENTA VERA

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DETROIT, MICHIGAN

GERIATRICS *in the* NEWS

All announcements and news relating to geriatric medicine and research should be directed to GERIATRICS, Editorial Department, 84 South Tenth Street, Minneapolis 2, Minnesota.

Postgraduate Courses

A course in geriatrics will be offered by the New York University Post-graduate School, 477 First Avenue, New York 16, January 27-29, 1954. The fee for the course is $30.00.

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The second postgraduate course in diabetes and basic metabolic problems to be conducted by the American Diabetes Association will be held at the Mayo Clinic and Mayo Foundation, Rochester, Minnesota, on January 18, 19, and 20. Directors of the course will be Dr. Edward H. Rynearson and Dr. Randall G. Sprague, consulting physicians in the section of medicine, Mayo Clinic, and professors of medicine at the Mayo Foundation. Details may be obtained by writing J. Richard Connelly, Executive Director, American Diabetes Association, 11 West 42nd St., New York 36, New York.

American Cancer Society Telecolor Clinics

The American Cancer Society, in conjunction with the CBS-TV network, has scheduled a series of 30 one-hour closed circuit color television programs on problems of cancer. The series, designed for the general practitioner, will be sent to six major cities—Boston, Philadelphia, Pittsburgh, Detroit, Toledo, and New York, for viewing on giant receivers.

Programs for January, broadcast from the Columbia-Presbyterian Medical Center, include: January 6, Diagnosis and Treatment of Uterine Cancer: January 13, Sarcoma of Soft Parts; January 20, Cancer of the Oral Cavity; and January 27, Cancer of the Larynx and Hypopharynx and Cancer of the Thyroid.

•

Mexican Geriatrics Society

The Mexican Society of Geriatrics held its fall program at the Academy of the National School of Medicine in Mexico City. Papers and speakers included: *Hernias*

(Continued on page 46)

new dosage form

for the bag

Dilaudid* sulfate

10 cc. Multiple Dose Vial

Each cc. contains 2 mg. (1/32 gr.) dihydromorphinone (Dilaudid) sulfate in sterile solution—convenient and ready for instant use.

Dilaudid—a powerful analgesic—dose, 1/32 grain to 1/20 grain.
a potent cough sedative—dose, 1/128 grain to 1/64 grain.
an opiate, may be habit forming.

• Dilaudid is subject to Federal narcotic regulations.
* Dilaudid ®, E. Bilhuber, Inc.

BILHUBER-KNOLL CORP. ORANGE, NEW JERSEY, U. S. A.

How much enjoyment can your geriatric patients get from life?

Of course, with the help of a good well-balanced diet, your older patients can be healthier and more active. That problem of diet is where Gerber's can be of tremendous assistance to you.

First of all, Gerber's variety is wide enough to allow for your patient's "foibles" about food—some of them built up over years and years. Yet that same variety gives you good prescription selectivity.

To help provide both the known and "unknown" nutritive factors, all of Gerber's Strained and Junior (Chopped) Foods are specially processed to retain natural food values to the maximum possible by modern methods.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

Added encouragement to staying with your prescribed regimen—Gerber's "Special Diet Recipes." They offer a tempting range of easy-to-make dishes for many tastes. FREE COPIES of this booklet, with recipes based on Bland, Soft, Mechanically Soft, Liquid and Low-Residue Diets. Just write on your letterhead to Dept. JG1-4, Fremont, Mich.

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AUTOETTE... the Perfect Car for the Physically Handicapped

Your infirm and physically-handicapped patients can now lead a happier, more useful life ...because of AUTOETTE, the *easiest* of all cars to drive.

The beautiful little *electric* AUTOETTE—with its *simplified* hand controls—is safe, quiet, powerful...just the thing for *paraplegics!*

Doctor, if your patients need mobility for outdoor activity, the AUTOETTE is a safe and efficient recommendation.

Costs only 3 cents a day!

The AUTOETTE costs *so little* to buy...and *practically nothing* to operate. Only *3 cents* for electricity for *30 miles* of driving!

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GERIATRICS *in the* NEWS

(Continued from page 44)

After 40, Dr. Jose Negrete Herrera; *Dermatologic Conditions in Geriatrics,* Dr. Julio Bejarano; *Infirmities of the Joints,* Dr. Manuel Payno; and *Physiotherapy for Arthritis in the Aged,* Dr. Mario A. Nava.

Merrell Plans Gerontological Laboratory

The William S. Merrell Company of Cincinnati have announced plans for the immediate construction of a gerontological laboratory as the fourth addition to their basic medical sciences unit. Research at the new laboratory, under direction of Dr. Harold W. Werner, will be toward development of drugs that will prevent or alleviate the chronic diseases of old age.

New Treatment Building

The Kessler Institute for Rehabilitation of West Orange, New Jersey, has opened a new treatment building, increasing bed capacity and doubling out-patient capacity of the Institute. The new unit, which will house departments of occupational therapy, speech therapy, and physical therapy, was opened at a dedication ceremony on December 6.

THE POWER OF CURATIVE HYPEREMIA

in minor muscular aches and pains due to exertion or fatigue, simple neuralgia and minor muscular strains

In numerous disorders of the joints or muscles, your patient suffers from a vicious cycle of pain causing vasoconstriction, and of vasoconstriction causing pain. To help remedy this condition, apply RUBIGUENT.

RUBIGUENT contains methyl nicotinate, the potent new penetrative agent, and histamine dihydrochloride, a powerful vasodilator. Methyl nicotinate makes it possible for the histamine and the glycol monosalicylate to penetrate tissues, where they promote prolonged, pain-relieving hyperemia with beneficial local warmth.

SUPPLIED: TUBES OF ONE OUNCE

RUBIGUENT*

RUBEFACIENT CREAM, WYETH

Rubefacient...counterirritant...local analgesic

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CYCLOPENTYLPROPIONATE

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Each cc. contains:

Testosterone Cyclopentylpropionate .....50 mg. or 100 mg.
Chlorobutanol.....5 mg.
Cottonseed Oil.....q.s.

50 mg. per cc. available in 10 cc. vials

100 mg. per cc. available in 1 cc. and 10 cc. vials

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NEWS *from Advertisers*

Laff Begins at Forty—Pages

don herold, who uses no capital letters for his own name, has turned out many a merry cartoon in his sixty-five years but none gayer than those that decorate his little volume Feel Fit as a Fiddle after Forty which is marked "25c" but is to be had for nothing with the compliments of Knox Gelatine, Charles B. Knox Gelatine Co. Inc., Johnstown, N. Y.

If you want a copy don't hesitate to ask for it. Mr. James E. Knox, general manager, will be happy to send you one. Tell him Groucho sent you.

The brochure opens ingenuously enough, with a chapter entitled You're as Old as you Eat and one is completely captivated —as well as informed—by the time he arrives at the closing sections of Part I, How to Use Knox Gelatine, What is Knox Gelatine Made of?, Knox Gelatine in Reducing Diet and Other Knox Gelatine Diets.

One of the best things about it is that there's another part, You Are as Young as You Think which includes You've Gotta Rehearse for Retirement, Don't Become a Character, weight charts and a gem of an admonition, "Don't let your sense of humor die on the vine." Wise words.

•

Hypercholesteremia and Aging

When screening 960 consecutive medical admissions to Fordham Hospital, New York City, Sherber and Levites found that mean cholesterol levels and the incidence of hypercholesteremia increase with age. Among the 131 hypercholesteremics (300 mgs. % and over) discovered, 90% fell into the cardiovascular and diabetic groups.

In the experience of the investigators, Monichol (T.M. Ives-Cameron Co., New York, N. Y.) normalizes elevated serum cholesterol levels in idiopathic and familial hypercholesteremia within four to six weeks when administered in 20 cc. daily divided doses. Failure to take Monichol uninterruptedly causes a prompt rise to pre-treatment levels because hypercholesteremia seems to be an inborn error of metabolism.

Monichol causes a mild diuresis and invariably creates a sense of well-being in the patient.

GOOD FOR GRANDMA, TOO!

Borcherdt

MALT SOUP Extract*

A New Dietary Management for

CONSTIPATED ELDERLY

A bowel content modifier that softens dry, hard stools by dietary means without side effects.[1] Acts by promoting an abundant fermentative bacteria in the colon, thus producing soft, easily evacuated stools. Retards growth of putrefactive organisms. By maintaining a favorable intestinal flora, Malt Soup Extract provides *corrective therapy for the colon, too!*

DOSE: 2 tablespoonfuls b.i.d. until stools are soft (may take several days), then 1 or 2 Tbs. at bedtime.

*Specially processed malt extract neutralized with potassium carbonate. In 8 oz. and 16 oz. bottles.

1. Cass, L. J. and Frederik, W. S.: Malt Soup Extract as a Bowel Content Modifier in Geriatric Constipation. Journal-Lancet, 73:414 (Oct.) 1953.

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BORCHERDT MALT EXTRACT CO.

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the realization of a hope . . .

a new physio-chemical complex that consistently and significantly reduces elevated serum cholesterol levels.

MONICHOL*

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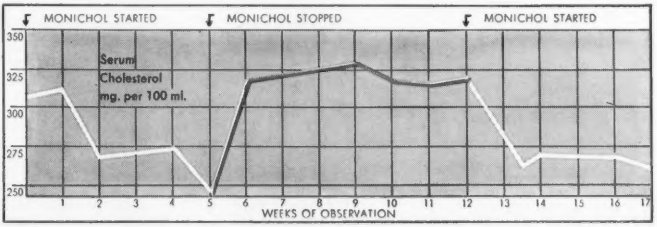
This typical response of an idiopathic hypercholesteremic patient to an uninterrupted daily intake of Monichol — an entirely non-toxic medication — shows a significant drop from 306 mg. to 240 mg. per 100 ml. of serum cholesterol after five weeks of medication.†

The investigators† stress the need for continued administration ot Monichol because idiopathic or familial hypercholesteremia is most probably an *inborn error of metabolism.*

Uninterrupted Daily Intake of Monichol
Essential in the Management of Hypercholesteremia



Please note the *prompt rise of the serum cholesterol to pre-treatment levels* when medication was stopped. We, therefore, urge you to ask your patients to have their prescriptions refilled as soon as their supply is exhausted.

Indications: For the therapeutic and prophylactic management of hypercholesteremia so frequently associated with cardiovascular disease and diabetes.

Dosage: The recommended dosage of 1 teaspoonful four times or two teaspoonfuls twice daily after meals is both the minimum and the optimum dosage.

Formula: Each teaspoonful (5 cc.) contains:

Polysorbate 80	500 mg.
Choline Dihydrogen Citrate	500 mg.
Inositol	250 mg.

Supplied: Bottles of 12 oz.

†Sherber, D. A., and Levites, M. M.: Hypercholesteremia. Effect on Cholesterol Metabolism of a Polysorbate 80-Choline-Inositol Complex (MONICHOL) J.A.M.A. 152:682 (June 20) 1953. *Trademark

Monichol normalizes cholesterol metabolism

IVES-CAMERON COMPANY, INC., 22 East 40th Street, New York 16, N. Y.

What about Cobalt?
–in anemia–

Q. Why is Roncovite* effective in anemias of bone marrow depression due to infection or disease?

A. Because cobalt is the only agent known which, by stimulating erythropoiesis, will cause the hemopoietic system to utilize the iron already available to it.

Q. Why use cobalt in iron-deficiency anemia—isn't iron alone adequate?

A. Roncovite is preferentially indicated in ALL forms of "secondary" or iron-deficiency anemia for the following reasons:

Many so-called iron-deficiency anemias are in reality a combination of an iron-deficiency and an inhibition of hemopoiesis *resulting from long continued extra drain* on the bone marrow.

With iron alone,[1] therefore, a complete clinical response is often difficult or impossible to obtain—only very small gains or poor responses being frequently reported in "low-grade anemias."

Roncovite, by providing the added bone marrow (red cell) stimulant action of cobalt, will supply that added extra "push" to mobilize iron reserves, produce a faster response, greatly superior erythropoiesis and up to fourfold increases in the utilization of iron.[2]

Q. Can I be sure that cobalt is safe for routine use?

A. Cobalt is an essential element with a low order of toxicity—no greater than that of iron. A cobalt chloride dosage of as high as 1200 mg. per day, in divided doses, has produced no severe toxic effects even if continued for six weeks.[3] This is equivalent to a daily dosage of over 80 Roncovite tablets.

Q. Is cobalt cumulative?

A. No—extensive pharmacological investigation proves that cobalt is rapidly and almost completely excreted via the urine[4] so that there is little if any cumulative effect even after periods exceeding 100 days of continuous parenteral use. The body shows no significant amounts of cobalt 48 hours after the last dose.[4]

Q. Is the improvement with Roncovite noticeably rapid?

A. Yes—the patient often voluntarily reports an increased sense of well-being within a few days—as reported by documented clinical evidence.

Roncovite is not indicated in pernicious or megaloblastic anemia.

RONCOVITE

The First True Hematopoietic Stimulant

HOW SUPPLIED:

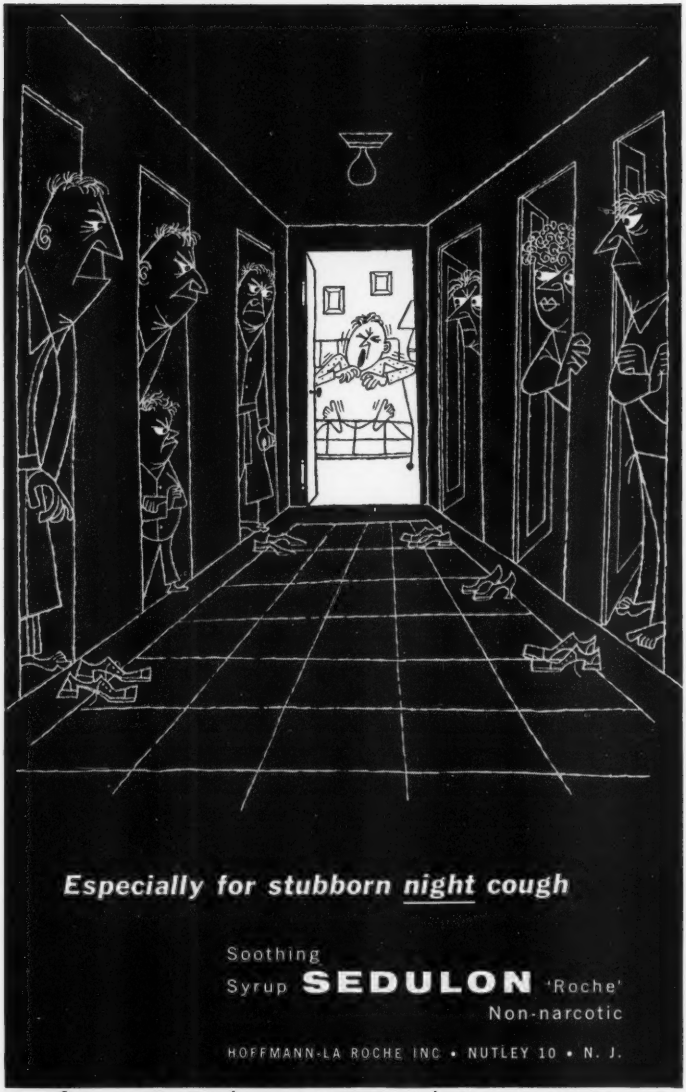
Roncovite Tablets—enteric coated, red, each contains cobalt chloride, 15 mg.; exsiccated ferrous sulfate, 0.2 Gm.; bottles of 100.

Roncovite Drops—each 0.6 cc. contains cobalt chloride, 40 mg.; ferrous sulfate, 75 mg.; bottles of 15 cc. with calibrated dropper.

1. Cass, L. J.; Frederick, W. S., and DiGregario, S.: Journal-Lancet *51*:73 (1953).
2. Rohn, R. J., and Bond, W. H. Jr.: Lancet *73*:301 (1953).
3. Berk, W., et al: New England J. M. *240*:754 (May) 1949.
4. Berlin, N. I.: J. Biol. Chem. *187*:41 (1950).

*The original Cobalt-Iron Product.

LLOYD BROTHERS, Inc., Cincinnati 3, Ohio



SEDULON®--BRAND OF DIHYPRYLONE (3,3-DIETHYL-2,4-DIOXO-PIPERIDINE)

HOME ADMINISTRATION OF THIOMERIN®

Thiomerin, like insulin, is easy and convenient to inject. It is well tolerated, and as predictable in effect when injected *subcutaneously* as when given intramuscularly or intravenously.

More and more physicians are finding it desirable to instruct the patient or a member of his family in the use of Thiomerin, so that injections between office visits can be made on schedule.

An attractively illustrated FREE booklet, giving detailed instructions for patients on self-injection of Thiomerin, is available to physicians. It will save time and effort in explaining the procedure.

THIOMERIN®
SODIUM
MERCAPTOMERIN SODIUM WYETH
Council-Accepted Mercurial Diuretic for Subcutaneous, Intramuscular, or Intravenous Injection

Wyeth®
Philadelphia 2, Pa.

a suitable choice for lipotropic therapy in

CIRRHOSIS • CORONARY DISEASE
ATHEROSCLEROSIS • DIABETES

GERICAPS

Gratifying clinical improvement reported with the use of lipotropics in cirrhosis, coronary disease, atherosclerosis and diabetes has resulted in widespread adoption of this therapy.

The choice of the lipotropic used is critical to the patient's response and the success of this management. Gericaps offers a high potency lipotropic formula plus *extra* factors to assure optimal results.

Each Capsule Supplies:

- CHOLINE & INOSITOL synergistically equivalent to aproximately 1 Gm. of choline dihydrogen citrate. Superior potency of the *true* lipotropic factors.
- RUTIN 20 mg. and VITAMIN C 12.5 mg. To help prevent or improve capillary fragility and/or permeability.
- VITAMIN A 1000 units and B-COMPLEX 7.25 mg. To aid in compensating for deficiencies in a fat and cholesterol restricted diet.

Supplied in bottles of 100

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BIOLOGICALS • PHARMACEUTICALS
WINDSOR DETROIT 15, MICH. LOS ANGELES

Meat...

and Its Place in the Diet in Hypertension

Contrary to the concept that protein intake contributes to the genesis of hypertension and should be drastically reduced in therapy[1, 2, 3] adequate protein nutrition today is considered essential for preserving maximal vigor and a sense of well-being in the hypertensive patient.[3] Meat, once thought to be contraindicated, now is recognized as an important protein food in the dietary regimen in hypertension.

High-protein foods do not elevate arterial tension — neither in the hypertensive nor the normotensive person. Nor does the specific dynamic action of protein make undue demands on the heart.[2, 3, 4] Only in advanced hypertension when renal function is seriously impaired, or in cardiac emergency episodes, when cardiac disease complicates hypertension, is restriction of protein intake below the normal allowance of 60 to 70 Gm. per day justifiable.[2, 3]

But not only for its high content of biologically top-quality protein is meat a recommended daily food in the diet of the hypertensive patient. It also goes far toward satisfying the needs for essential B vitamins and minerals. Another important feature of meat is its outstanding taste appeal and its virtually complete digestibility.

---

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3. McLester, J. S., and Darby, W. J.: Nutrition and Diets in Health and Disease, ed. 6, Philadelphia, W. B. Saunders Company, 1952, pp. 519-524.
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The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

American Meat Institute

Main Office, Chicago... Members Throughout the United States

"24-hour" pain relief*
for the rheumatic patient, with

Pabalate®

Robins

Clinically proven more effective than salicylates alone—and remarkably free from toxic effects, even on prolonged use. Each yellow enteric-coated Tablet provides 0.3 Gm. (5 gr.) sodium salicylate U.S.P., and 0.3 Gm. (5 gr.) para-aminobenzoic acid (as the sodium salt).

NOW, each Tablet also contains 50 mg. ascorbic acid. NO increase in cost to patient.

• • •

Pabalate-Sodium Free is equally effective—for use when sodium intake is restricted, as in certain circulatory diseases, and for concurrent administration with ACTH and cortisone.

Each Persian rose enteric-coated Tablet provides 0.3 Gm. (5 gr.) ammonium salicylate, and 0.3 Gm. (5 gr.) para-aminobenzoic acid (as the potassium salt).

A. H. ROBINS CO., INC. • Richmond 20, Va.

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*Smith, R. T.: J. Lancet 70:192, 1950

Or, when sodium intake is restricted

Pabalate®-Sodium Free

A.H. ROBINS CO., INC. 75TH ANNIVERSARY

In female breast carcinoma

Results of a recent clinical study show that Neodrol is effective in the palliative treatment of advanced, inoperable breast cancer in the female. Of the 42 patients (some with both soft tissue and osseous metastases) treated with Neodrol, 43% demonstrated objective improvement.

OBJECTIVE IMPROVEMENT	with Neodrol	with testosterone or its esters
In soft tissue metastases	39% (14 of 37 pts.)	22% (38 of 174 pts.)
In osseous metastases	25% (8 of 32 pts.)	19% (26 of 133 pts.)

SUBJECTIVE IMPROVEMENT	Patients with referable symptoms	Patients improved with Neodrol
Pain	28	22
Anorexia	11	10
General Malaise	10	8
Cough	7	6
Dyspnea	13	8
Headache	6	6
Nausea	6	4
Vomiting	4	3
Total	36	31

Of the 36 patients with symptoms referable to their carcinoma, a total of 87% experienced symptomatic improvement under Neodrol therapy.

Escher, G. C., et al.: Clinical Research Proceedings 1:51 (Apr.) 1953.

with a NEW crystalline steroid

NEODROL*

BRAND OF STANOLONE

Supplied: 10 cc. vials, 50 mg./cc.

A PFIZER SYNTEX PRODUCT

Pfizer

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N.Y.

*TRADEMARK

When Chronic Fatigue, Insomnia are due to Low Blood Sugar Level . . .

Prescribing a simple change in diet may often restore energy and zest for living in many patients.

THE pace of modern living . . . business pressures, strenuous social activities, hurried meals, improper diet . . . all too frequently lead to exhaustion, loss of energy, inability to sleep. Now clinical studies show that these clinical manifestations are often associated with hyperinsulinism—causing a lowered *blood sugar level.**

Portis reported these fatigue states were aggravated when the patients consumed beverages and foods that contained free sugar. He further stated that while these raise the blood sugar level momentarily, their "free" sugar is burned up too quickly, and a greater letdown follows. On the basis of this evidence a diet high in proteins and relatively high in carbohydrates in a complex form was given to his patients. He found such foods as milk are especially beneficial because they are digested more slowly, and because they maintained the blood sugar level for a longer period.

For these reasons milk with Postum is suggested as a between-meal feeding and bedtime drink. It can often be of practical benefit to the patient. The milk provides nourishment that is slowly, steadily converted to blood sugar. Postum offers a pleasant and palatable flavor. Postum offsets the distaste for hot milk.

Moreover, Postum in the milk drink has a psychological advantage because many patients resent the taking of milk in itself as a regression to their childhood patterns. Postum has been recommended by doctors for over 40 years. It is widely known to your patients as a caffein-free drink—a beverage that has helped countless caffein-susceptibles to break the coffee and tea habit.

We will be glad to secure for you a reprint of Dr. Portis' article. We will also send you without charge a supply of Postum for your patients if you send in the coupon below.

*Portis, Sidney A., Life Situations, Emotions and Hyperinsulinism, J.A.M.A. **142:** 1281-1286 (April 22) 1950.

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☐ Please send me a Professional Pack of POSTUM containing 12 sample-size packages.

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Offer Expires June 30, 1954. Good only in Continental U. S. A.

"But Doctor, how can I eat without salt?"–

Many doctors and nutritionists report that the *real* problem of the low-sodium diet centers around the unpalatability of the patient's menu. The most frequent complaint is that unsalted foods taste flat, insipid.

The use of fresh lemon juice is proving of genuine benefit to many thousands on low-sodium diets. Patients find that a squeeze of lemon added at the table transforms tasteless, unsalted foods into tempting, appetizing ones. The sharp tang and aromatic flavor of fresh lemon juice compensate for the absence of salt.

Fresh lemon juice has a very favorable ratio of sodium to potassium. It is virtually sodium-free (approx. 1 mg. per 100 cc.) and is relatively high in potassium (130 mg. per 100 cc.).

In weight-reducing diets, when salt restriction is advisable, seasoning with fresh lemon juice adds zest and flavor to low-calorie foods.

Suggest that a dish of lemon wedges be placed on the table every meal.

A handy diet booklet for distribution to patients on low-sodium diets is available without charge. Please specify quantity. Write Sunkist, Section M-9501, Terminal Annex, Los Angeles 54, California.

Sunkist®

fresh lemons

Lederle

Artane®

HYDROCHLORIDE

Trihexyphenidyl Hydrochloride *Lederle*

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POSTENCEPHALITIC • ARTERIOSCLEROTIC • IDIOPATHIC

ARTANE *Lederle* exerts an antispasmodic effect on muscle and inhibits parasympathetic nervous activity. Thus, muscle spasm is relaxed both directly and indirectly—a two-fold action especially valuable in the symptomatic relief of Parkinsonism of all three types.

ARTANE does not lose effectiveness with repeated use, and even when administered over long periods, exerts no deleterious action on bone marrow function.

ARTANE is administered orally, in tablet or elixir form, three or four times daily. Dosage starts with 1 mg. the first day, gradually increased, according to response, to 6 mg. to 12 mg. daily.

ARTANE TABLETS are supplied in 2 mg. and 5 mg. strengths, in bottles of 100 and 1,000. ARTANE ELIXIR (2 mg. per teaspoonful [4 cc.]) is supplied in 16 fluid ounce bottles.

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AMERICAN Cyanamid COMPANY

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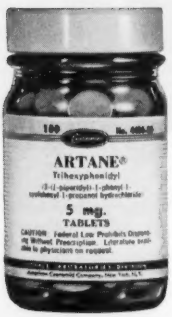
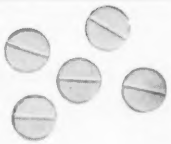
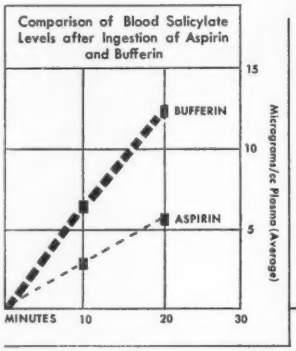




Faster Pain Relief with BUFFERIN®

1 ACTS TWICE AS FAST AS ASPIRIN

The antacids in Bufferin speed its pain-relieving ingredients through the stomach and into the blood stream. Actual chemical determinations show that within ten minutes after Bufferin is ingested blood salicylate levels are higher than those attained by aspirin in twice this time.[1]



2 DOES NOT UPSET THE STOMACH

Bufferin's antacid ingredients protect the stomach against aspirin irritation. This has been clinically demonstrated on hundreds of patients.

in usual doses

In a series of 238 cases, 22 had a history of gastric distress due to aspirin but only one reported any distress after taking 2 Bufferin tablets (equivalent to 10 grains of aspirin).[1]

in large doses

In a recent study group, 1006 patients received, over a 24 hour period, 12 Bufferin tablets (equivalent to 60 grains of aspirin). Although 72 had a history of being sensitive to aspirin, only 18 reported any gastric side-effect with Bufferin.[2]

1. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid. J. Am. Pharm. Assoc., Sc. Ed. 39:21, Jan. 1950
2. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951

INDICATIONS: Simple headaches, neuralgias, dysmenorrhea, muscular aches and pains, discomfort of colds and minor injuries. Particularly useful when gastric hyperacidity is a complication. Useful for relieving pain in the treatment of arthritis.

EACH BUFFERIN TABLET contains 5 grains of acetylsalicylic acid, together with optimum amounts of the antacids aluminum glycinate and magnesium carbonate.

AVAILABLE in vials of 12 and 36 tablets and in bottles of 100. Tablets scored for divided dosage.

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In the treatment of Hypertension

Effectively

mannitol hexanitrate exerts vasodilator action and persistent relaxation of smooth muscle

New and Nonofficial Remedies: A.M.A. Council on Pharmacy and Chemistry, J. B. Lippincott, p. 243, 1953.

Safely

fewer side effects with mannitol hexanitrate ... greater percentage fall in blood pressure

N. Y. Physician *31*:20 (Jan.) 1949.

Economically

combined medication that provides simultaneously:

vasodilatation (mannitol hexanitrate)
diuresis (theophylline)
sedation (phenobarbital)
capillary protection (ascorbic acid + rutin)

Semhyten®

BRINGS THE PRESSURE DOWN SLOWLY **SAFELY**

Complete Medication for the Hypertensive

Each Semhyten Capsule contains:		Phenobarbital	¼ gr. (15 mg.)
Mannitol Hexanitrate	½ gr. (30 mg.)	Rutin	10 mg.
Theophylline	1½ gr. (0.1 Gm.)	Ascorbic Acid	15 mg.

Supplied: In bottles of 100, 500 and 1000 pink-top capsules.

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Especially for Elderly Patients . . . in

CHRONIC URINARY INFECTIONS

Better Control with Less Control . . .

★*Non-Toxic*
★*No Drug Fastness*
★*May Be Given Over Long Periods of Time*

A self-acidifying methenamine urinary antiseptic permitting high dosage without toxicity. Quickly soothes inflamed mucosa. Bacteriostatic against E. Coli, S. Albus, S. Aureus. Requires no periodic blood tests, etc. May be prescribed alone or with suitable antispasmodics and sedatives as individually required—tr. belladonna, tr. hyoscyamus, phenobarbital, etc. Especially useful for older patients.

(Sample Prescription)

℞ Tr. Belladonna ℥ii
Urolithia qs. ad ℥viii
Sig ℥ii 2 D.C. cup
warm water ½ hr. AC.

UROLITHIA

SEND FOR SAMPLES

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Old Age Benefits . . .
from TESTRAMONE *and* VITRAMONE

Testramone and Vitramone have an important place in the treatment of general debilities of old age, such as poor appetite, bad sleeping habits, inadequate nutrition, hepatic insufficiency, bowel impairment and dysfunction, tired sluggish feeling, and similar conditions. Supplied in 10 cc. multiple dose ampul vials for intramuscular injection. Recommended dose 1 cc., most effective when ½ cc. each is given in same syringe.

FORMULAE

TESTRAMONE*— Each CC. Contains:

Testosterone in macrosuspension	12½ mg
Thiamine HCl	10 mg
Riboflavin	2 mg
Pyridoxine HCl	5 mg
Niacinamide	40 mg
Inositol	50 mg
Choline Chloride	10 mg
d.l. Methionine	10 mg
Benzyl Alcohol	1%
Chlorobutanol (chloral derivative)	½%
Distilled water q.s.	1 cc.

VITRAMONE*— Each CC. Contains:

Natural estrogenic hormone in macrosuspension or 10,000 Intern units	1 mg
Thiamine HCl	10 mg
Riboflavin	2 mg
Pyridoxine HCl	5 mg
Niacinamide	40 mg
Inositol	50 mg
Choline Chloride	10 mg
d.l. Methionine	10 mg
Benzyl Alcohol	1%
Chlorobutanol (chloral derivative)	½%
Distilled water q.s.	1 cc.

*U. S. Patent applied for.

Send for literature and professional samples of these aids in the treatment of male climacteric and menopause.

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PHONE: VICTOR 4-0936

Two years ago, findings of importance to dietitians everywhere were published, emphasizing the superiority of reconstituted MINUTE MAID Fresh-Frozen Orange Juice over home-squeezed juice of the same type oranges, in three respects:

(a) *Average levels of ascorbic acid significantly higher in* MINUTE MAID: Obviously, this advantage of MINUTE MAID, observed in the samples tested, is susceptible to variation, from season to season, as crops differ. It should be emphasized, however, that, penny for penny and year after year, the lower-priced MINUTE MAID offers the housewife *more* ascorbic acid than she could get from home-squeezed orange juice.

(b) *Peel oil content significantly lower:* Samples of orange juice, home-squeezed by typical housewives, showed contents of peel oil, a cause of allergic response and poor tolerance, especially in infants, were up to 700% higher than in MINUTE MAID!

(c) *Bacterial counts dramatically lower:* Bacterial counts were found to be as high as 350,000 per ml. in home-squeezed samples, but were uniformly low in MINUTE MAID.

Since publication of the above findings, more and more physicians are recommending MINUTE MAID Fresh-Frozen Orange Juice in place of home-squeezed orange juice where optimum year-around intake of natural Vitamin C is indicated.

And now comes more evidence in favor of MINUTE MAID . . .

New Assays Reaffirm Dietary Advantages of Minute Maid Fresh-Frozen Orange Juice on a Cost Basis

A second report comparing the individual mineral and vitamin values of MINUTE MAID Fresh-Frozen Orange Juice and home-squeezed juice of the same type oranges has recently been published.

In this latest study, each sample was analyzed separately. The analyses showed that MINUTE MAID Fresh-Frozen Orange Juice was equal to, or superior to, the home-squeezed juice in *all* of the components listed below:

TABLE

Mean Values in Samples Tested

COMPONENT	UNITS	MINUTE MAID FRESH-FROZEN ORANGE JUICE	HOME-SQUEEZED ORANGE JUICE
Betaine	mg./100 ml.	49	46
Biotin	mcg./100 ml.	0.26	0.26
Choline	mg./100 ml.	12	12
Cobalt	mcg./100 ml.	74	67
Folic acid	mcg./100 ml.	2.2	2.2
Iodine	mcg./100 ml.	0.24	0.21
Manganese	mcg./100 ml.	33	18
Nitrogen			
Total	mg./100 ml.	104	79
Amino	mg./100 ml.	22	22
Volatile	mg./100 ml.	8	7
Non-volatile	mg./100 ml.	96	72
Pantothenic acid	mcg./100 ml.	146	145
Para-amino-benzoic acid	mcg./100 ml.	4	4
Phosphorus	mg./100 ml.	19	18
Potassium	mg./100 ml.	380	290
Riboflavin	mcg./100 ml.	18	17
Tocopherols	mg./100 ml.	107	104
Vitamin A	mcg./100 ml.	19	16
Thiamine	mcg./100 ml.	87	83
Vitamin B_{12}	mcg./100 ml.	0.0022	0.0012

Although the results are again susceptible to variation according to crop and year, Fresh-Frozen MINUTE MAID was equal to the home-squeezed juice in the samples tested for the largest number of components listed; and in the mean values for iodine, manganese, potassium, Vitamins A and B_{12}, MINUTE MAID showed appreciably *higher* values.

SUMMARY

These new findings help enlarge professional knowledge of the nutrient constituents of orange juice in general and add fresh evidence that, on a cost basis, MINUTE MAID Fresh-Frozen Orange Juice has significant dietary advantages. Penny for penny, MINUTE MAID offers not only *more* Vitamin C, but also *more* of all the other vitamins and minerals listed than home-squeezed orange juice.

Taken in conjunction with the previously published findings, this should confirm the choice of physicians who recommend MINUTE MAID in place of home-squeezed orange juice.

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(1) Rakieten, M. L., *et al.*, Journal of the American Dietetic Association, October, 1951.
(2) Joslin, C. L., and Bradley, J. E., Journal of Pediatrics, Vol. 39, No. 3, pp. 325-329 (1951).
(3) Rakieten, M. L., *et al.*, Journal of the American Dietetic Association, November, 1952.
(4) Assn. Official Agricultural Chemists: Methods of Analysis, 7th ed. Washington: Assn. Off. Agric. Chemists, 1950.

Reference #3 still available in reprint form.

MINUTE MAID CORPORATION,
488 Madison Ave., N.Y. 22, N.Y.
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IN URINARY INFECTIONS

a rapid recovery . . .

a quicker return . . .

Because Terramycin covers practically the entire *broad spectrum* of urinary pathogens, it may be relied upon to get patients back to work sooner—even when previous therapy with other agents was unsuccessful.

> *"Terramycin is an effective antibiotic for treating many urinary infections caused by both gram-positive and gram-negative organisms, and has cured where all other antibiotics have failed."*[1]

Terramycin is *widely distributed* in the body, appears in the serum and urine within a short time after administration and maintains therapeutic levels over extended periods.

> *"Terramycin was selected in preference to other broad spectrum antibiotics in view of high urinary excretion rate following small oral doses of the antibiotic."*[2]

Given in the recommended daily adult dose of 250 to 500 mg. every six hours, Terramycin is exceptionally *well tolerated.*

> **"It has not exhibited toxicity, and side-effects have not constituted a problem in therapy."**[3]

1. Trafton, H. M., and Lind, H. E.: J. Urol. 69:315 (Feb.) 1953.
2. Blahey, P. R.: Canad. M. A. J. 66:151 (Feb.) 1952.
3. Knight, V.: New York State J. Med. 50:2173 (Sept. 15) 1950.

an antibiotic of choice

Terramycin

Brand of oxytetracycline

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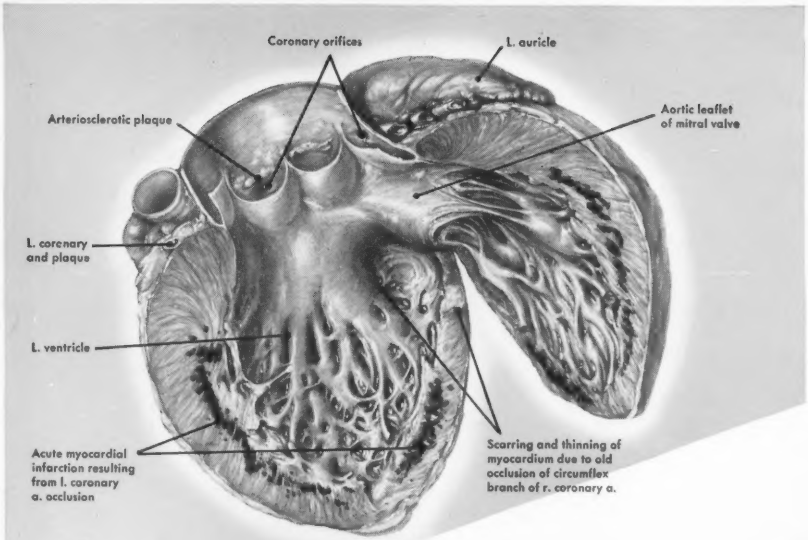
Coronary orifices
L. auricle
Arteriosclerotic plaque
Aortic leaflet of mitral valve
L. coronary and plaque
L. ventricle
Acute myocardial infarction resulting from l. coronary a. occlusion
Scarring and thinning of myocardium due to old occlusion of circumflex branch of r. coronary a.

Myocardial Infarction
with Severe Shock:

Reduction of Mortality

"... in correcting the state of shock we have enabled certain patients to recover from the initial episode, which otherwise gave every indication of culminating in death."[1]

Levophed infusion causes a striking rise in oxygen tension in areas of myocardial ischemia produced by coronary obstruction.[2] "It is therefore reasonable to suppose that the restoration of arterial pressure to a level consistent with an adequate coronary flow must limit the size of the infarct, save healthy myocardium, shorten the period of shock, and lessen the likelihood of congestive failure at a later date."[3]

"Severe cardiogenic shock demands therapy... the most efficacious method of treatment now available is use of vasopressor drugs."[4] "Current usage favors nor-epinephrine."[5]

References:

1. Kurland, G. S., and Malach, Monte: *New England Jour. Med.*, 247:383, Sept. 11, 1952.
2. Sayen, J. J., et al.: *Jour. Clin. Investigation*, 31:658, June, 1952.
3. Gilchrist, A. R.: *Brit. Med. Jour.*, 2:351, Aug. 16, 1952.
4. Miller, A. J., et al.: *J.A.M.A.*, 152:1198, July 25, 1953.
5. Levine, H. D., and Levine, S. A.: *Med. Clin. North America*, 37:955, July, 1953.

WINTHROP-STEARNS INC.
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BITARTRATE

Brand of Levarterenol bitartrate *(nor-epinephrine)*

THE MOST POWERFUL PRESSOR ANTIDOTE FOR

Shock

Supplied: Levophed bitartrate solution 0.2 per cent (equivalent to 0.1 per cent base), ampuls of 4 cc., boxes of 10. (Each 4 cc. to be administered in 1000 cc. of 5 per cent dextrose.)

Levophed, trademark reg. U.S. Pat. Off.

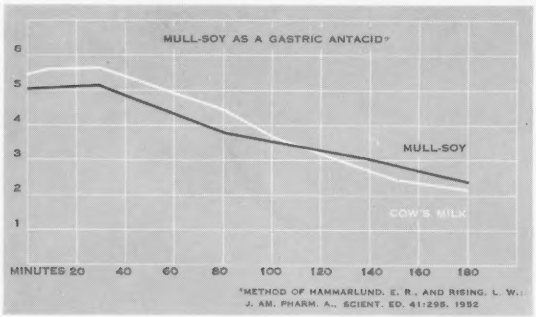
Facts about a *hypoallergenic food* for ulcer patients

MULL-SOY®

[Hypoallergenic Soy Food]

For over 15 years, MULL-SOY has been widely prescribed as a hypoallergenic alternative to milk for general dietary use, particularly among infants.

MULL-SOY exhibits a prompt and sustained acid buffering action comparable to that obtained with cow's milk.



MULL-SOY is a particularly nonirritating food, because it forms *no curds* with digestive enzymes and only finely divided curds on contact with gastric acid.

MULL-SOY is high in glycerides of the unsaturated fatty acids (especially linoleic), and contains a significant amount of lecithin.

On the basis of these facts, increasing numbers of physicians are using MULL-SOY in ulcer diets, particularly for milk-sensitive patients.

Samples and professional literature are available to all physicians interested in clinical trials.

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Please send me professional literature and samples of MULL-SOY for clinical trial in ulcer therapy.

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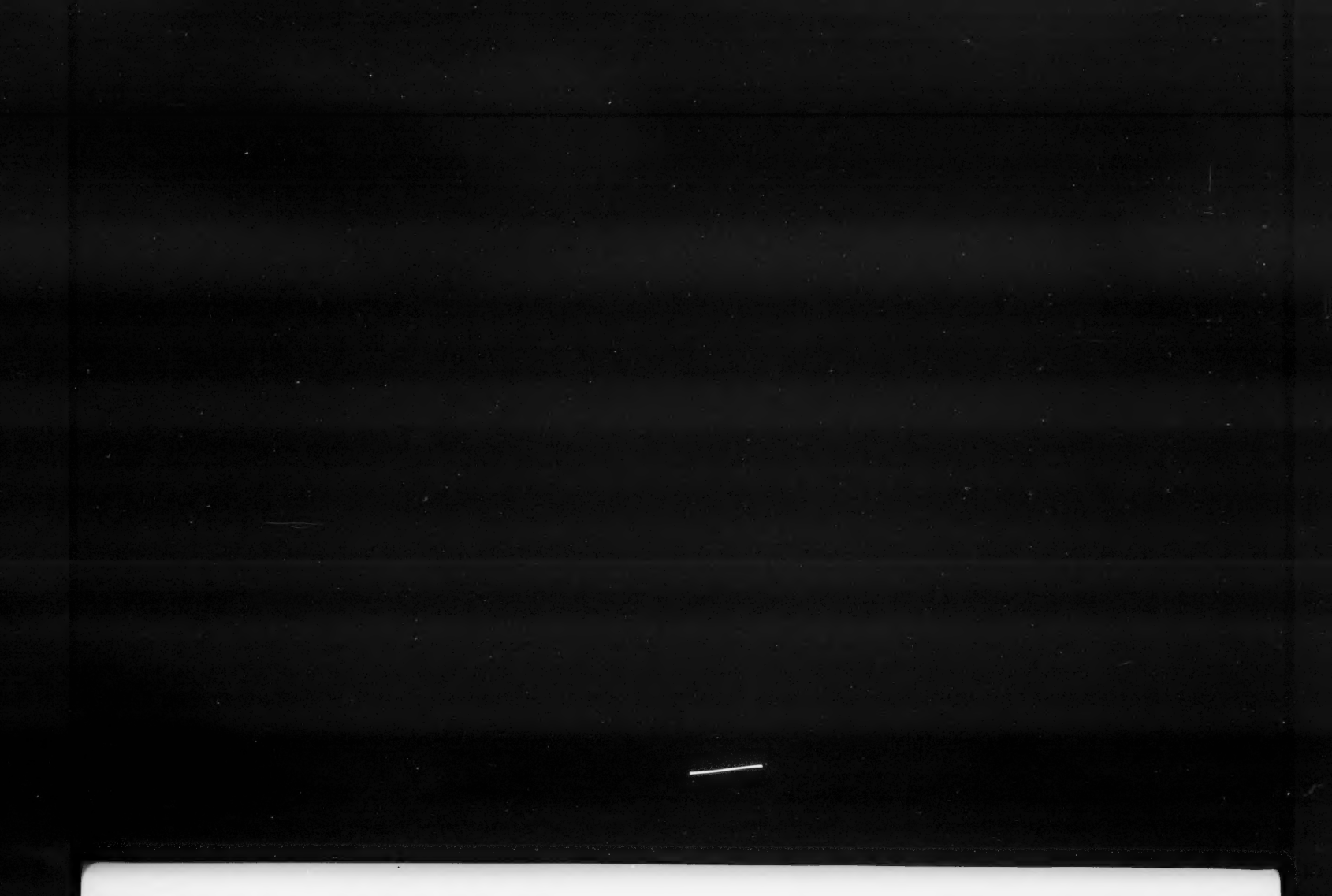
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